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VOLUME XXIX.

The Physician and Surgeon

A PROFESSIONAL MEDICAL JOURNAL.

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AUTHORS.

PAGE.
Adler, Lewis H. Jr., ... 266
Anderson, Willis S., 36, 128, 164, 224, 238, 299, 317, 368, 413, 462, 558
Beach, William M., ... 262
Berry, Gordon, ... 26
Birchmore, Woodbridge H., . . 155
Breakey, James F., 17, 38, 129, 370, 414
Breakey, William F., . 335, 468, 544
Brick, J. Coles, ... 269
Butterfield, Elmore E., . . . 49
Caulkins, John S., ... 251
Chapin, William S., ... 485
Childs, Leroy W., ... 25
Cooke, A. B., ... 269
Cowie, David M., . 408, 437, 459, 485
Cushman, Marshall L., 223, 274, 344, 366, 412, 462
Darling, Cyrenus G., 140, 216, 357, 383, 433, 575
Dock, George, 48, 123, 142, 145, 192, 241, 334, 432, 479, 575
Earle, Samuel T., ... 260, 265
Evans, George B., ... 263
Fisher, Frank, ... 29
Freund, Hugo A., . . . 24, 43, 131
Gue, Arthur E., ... 120
Hamilton, Edwin A., ... 265
Harpster, C. Melvin, ... 534
Harris, Joseph A., ... 166
Hill, T. Chittenden, ... 268
Hirschman, Louis J., 37, 164, 231, 317, 335, 337, 370, 414, 465
Hoff, Nelville S., ... 351
Holmes, Arthur D., 35, 96, 127, 161, 219, 273, 311, 360, 410, 461, 556

PAGE.
Klingmann, Theophil, ... 400
Krouse, Louis J., ... 267
Loree, Ira D., 128, 162, 239, 312, 336, 362, 411, 557
Martin, Collier F., ... 263
McCaskey, George W., ... 149
McJunkin, Frank A., . . . 21, 213
McKee, Edward S., . . 228, 321, 467
McMurrich, J. Playfair, ... 143
Morley, William H., . . . 34, 126
Morse, John L., ... 97
Murray, Dwight H., . . . 267, 270
Neff, Irwin H., 130, 166, 226, 318, 372, 417
Owen, Robert W. G., ... 289
Parker, Delos L., 39, 347, 376, 420, 432, 528, 562, 574, 575
Parker, Walter R., 162, 221, 313, 363
Parnall, Christopher G., 33, 125, 160, 288, 310, 333, 336, 359, 460, 556, 576
Pennington, J. Rawson, ... 262
Peterson, Reuben, ... 188, 529
Ricketts, Benjamin R., ... 350
Robinson, Byron, ... 247
Rous, Francis P., ... 40
Shepard, John F., ... 201
Smithies, Frank, 209, 227, 239, 275, 319, 374, 385, 418, 560
Walker, Frank B., 13, 32, 47, 96, 124, 159, 218, 270, 306, 459, 553, 576
Walker, Ralph E., ... 20, 481
Warthin, Aldred S., . . . 1, 69, 105
Webster, George W., ... 193
Willey, Vernon J., 165, 287, 333, 371, 416, 559
Wyman, Hal C., ... 203, 305

10672

ARTICLES.

A

- Abdomen, experimental work on the, 357.
- Abscesses, ischiorectal and pelviorectal, 268.
  - tubercular, 312.
- Actinomyces bovis, infection with, 213.
- Adenosarcoma of the mammary gland, 21.
- Albumin and casts, 361.
- Albumosuria, myelopathic, 320.
- Alcoholism, apomorphine in acute, 376.
- Anesthesia, local versus general, in rectal surgery, 263.
- Aphasia, 272.
- Appendicial stump, the disposition of the, 350.
- Appendicitis, 361.
  - and extrauterine pregnancy, 34.
  - and pregnancy, 127.
  - complete operation in all cases of, 32.
- Arteria ileocolica, arches of the, 247.
- Arthritis deformans treated by Bier's passive hyperemia, 209.
- Asthenopia, conjunctiva, due to glare, 315.
- Automatism, amnesic cerebral, in epilepsy, 400.

B

- Bacteria, urethral, as a factor in the etiology of cystisis in women, 33.
- Bacteriology of meat poisoning, 289.
  - of the blood in typhoid fever, 560.
- Blood, coagulation time of, 276.
  - culture technic, 319.
  - tests, occult, a comparative study of; a new modification of the guiac reaction; its value in legal medicine, 437.
  - the technic of direct transfusion of, 459.
- Brain surgery, the present status of, 130.
- Breast, carcinoma of the, 216.
- Bright's disease, the dietetic treatment of, 149.
- Bronchi, foreign bodies in, 317.
- Bursitis, bilateral tuberculous, of the hips, 557.

C

- Cancer and lupus, radium for the treatment of, 562.
  - of the rectum, 37, 414.
  - of the uterus, 359.
  - uterine, 359.
- Carcinoma of the breast, 216.
- Casts and albumin, 361.
- Cataract resulting from traumatism, 30.
- Celiotomy, anterior vaginal, 125.
- Cerebrospinal fluids, some motile elements seen in certain, 418.
  - fluid, the clinical examination of the, 408.
- Cesarean section following ventrosuspension of the uterus, 529.
- Conjunctiva asthenopia due to glare, 315.
- Conjunctivitis, granular, or trachoma, 363.
  - Parinaud's, 313.
- Constipation, the sigmoidal factor in, 265.
- Cramp, writer's, 226.
- Cryptitis, 269.
- Cystitis in women, urethral bacteria as a factor in the etiology of, 33.
- Cystocele and uterine prolapse, 556.
- Cytoxins, specific somatogenic, 40.

D

- Deafness, nasal obstruction a cause of, 164.
- Dermatology and syphilology, the need of higher requirements in examinations in, 544.
- Diabetic subjects, mastoiditis in, 223.
- Diet, infant, cow's milk in, 461.
- Dietetic errors and their effects, 39.
  - treatment of Bright's disease, 149.
- Digestive tract, the influence of the reflexes on the, 13.
- Doctor bills in Detroit, 467.

E

- Ear disease, the great psychical importance of, 166.
- Erysipelas, etiology of, nose and throat as a factor in, 558.

EDITORIAL:
- Abe's media for growing the gonococcus, 525.
- Abnormal growth of mammary glands, 565.
- Albuminuria resulting from athletic excess, 423.
- A movement to revise medical nomenclature, 232.
- Anent salivary gland atrophy, 327.
- A new specialty in operative surgery, 421.
- A pioneer among medical periodicals, 43.
- Artificial respiration in the apparently drowned, 379.
- A showing with opsonins in private service, 423.
- Berthelot passes beyond, 182.
- Cerebrospinal meningitis complicating pregnancy, 470.
- Cold applications in hay asthma, 380.
- Congressional legislation on consumption, 43.
- Culture of the pathogenic organism of plague, 279.
- Deliberations of dermatologists, 468.
- Doctor of duplicity, 326.
- Differences in situation of the infant and adult stomach, 133.
- Drummond, the French-Canadian dialect poet; a biographical sketch and review, 166.
- Effect of baths on the viscosity of blood. 328.
- Estoppel proceedings anent medical periodicals, 563.
- Isolation of bacillus lepra from insects, 469.
- Lack of ambulances for London accident cases, 90.
- Medical books and book reviews, 424.
  - study for mercenary gain, 423.
- Movement for a medical building in Detroit, 231.
- Observations regarding opsonic research, 377.
  - respecting the native opossum, 183.
- Pharmacists and physicians, 567.
- Practical data regarding blood pressure, 566.
- Prenatal contraction of pneumonia, 565.
- Ram Narayan the rodent savior, 89.

EDITORIAL (Continued):
- Rare obstetric case reported by Ollerenshaw, 566.
- Rockefeller munificence and medical research, 525.
- Sanitary advances in South America, 525.
- Speculation concerning sex, 132.
- Splenic implantation in cretin subjects, 42.
- The Anglo-American medical association, 469.
- The bacillus paralyticus in the domain of psychiatry, 133.
- The Calmette tuberculin conjunctival test, 421.
- The causation of lingual cancer, 132.
- The damnable obliquity of the daily press, 278.
- The direful properties of dust, 182.
- The elimination of defectives by euthanasia, 88.
- The fight regarding insurance examination fees, 230.
- The growth cycle in the genesis of cancer, 181.
- The material and spiritual man, 232.
- The microbiosis of cerebrospinal meningitis, 328.
- The outlook for osteopathy in California, 89.
- The plaintive cry of prenatal infancy, 279.
- The role of inebriety in the causation of insanity, 277.
- The study of medical history by an internal medicine staff, 131.
- The therapeutic employment of red light in the eighteenth century, 380.
- Timely discussion regarding tuberculosis, 524.
- Trypsin finally tabled, 181.
- Views concerning venereal disease, 41.
- Why physicians do not prescribe United States Pharmacopœia and National Formulary preparations, 470.

Epilepsy, amnesic cerebral automatism in, 400.
Erysipelas of the face, 37.
Eye, melanosarcoma of, 32.
- traumatism of, 29.

Eyeball, foreign body in, 31.
Eustachian tubes in infants, 462.

F

Fecal impaction, 266.
Feeding and care of premature infants, 360.
  infant, 97.
  infant, citrate of soda in, 161.
  why percentage fails, 219.
Feet, flat or weakened, a proper shoe for, 159.
Fever, hay, the etiology and recent treatment of, 413.
  typhoid, bacteriology of the blood in, 560.
  typhoid, of children, 273.
  typhoid, the ophthalmo-reaction in, 375.
Fibula, partial loss of the tibia replaced by transfer of the, 362.
Fissure, etiology and symptoms of, 263.
Fistula, anorectal, 262.
Formulary, National, and the United States Pharmacopœia, 347.
Fossæ of Rosenmuller, observations on the, 225.

G

Gastroenterostomy, not a harmless operation, 218.
Gland, mammary, adenosarcoma of, 21.
Glands, salivary lymphocytoma, with prominent lesions in the intestinal lymphatic apparatus and in the, 49.
  transplantation of the parathyroid, and hypoparathyreosis, 272.
Gonococcus, pathologic changes caused by the, 460.
Gonorrhea in little girls, 35.
  in women, 160.
  unusual ocular manifestations of, 162.

H

Hematocytometer, a new fluid for the, 275.
Hemorrhage, the medical treatment of, 193.
  in resection of the liver, the prevention of, 553.
Hemorrhoidal clamp, 270.
Hemorrhoids, 317.
  and sciatica, 267.
  injection of carbolic acid in, 370.
  occult, from the rectum, 262.
Hip, a case of congenital anterior dislocation of, 162.
Hyperemia, Bier's passive, arthritis deformans treated by, 209.
  treatment in tuberculosis of the peritoneum, 555.

I

Infancy, meningitis in, 220.
Infant feeding, 97.
  feeding, citrate of soda in, 161.
Infants, dietetic management of, 311.
  premature, the care and feeding of, 360.
  pseudomasturbation in, 410.
  the weight of breast-fed, 556.
Infection, the tonsil as a portal of, 161.
  with actinomyces, 213.
Insanity, the need of popular lectures on, 418.
Intestinal obstruction, the management of some cases of, 433.
Iris, prolapse of, 30.
  traumatism of the, 30.
Itch, ground, the causative factor in the production of the dermatitis of, 129.

K

Keratitis, bullous, 29.
Kidney, laceration of the, 305.
  tuberculosis of the, surgical treatment of, 270.
Knee, resection of the, 312.

L

Laceration of the kidney, 305.
Laparotomy, after treatment of, 306.
Laryngeal disease, chronic, 462.
Leptomeningitis following radical mastoid operation, 223.
Leukemia, an experimental study of the effects of Roentgen rays upon the blood-forming organs, with special reference to the treatment of, 1, 69, 105.
Leukocytosis in whooping-cough, 220.
Liver, the prevention of hemorrhage in resection of the, 553.
Lupus and cancer, radium for the treatment of, 562.
  vulgaris—tuberculosis cutis, 17.
Lymphocytoma, with prominent lesions in the intestinal lymphatic apparatus and in the salivary glands, 49.

M

Mastoiditis in diabetic subjects, 223.
Mastoid operation, 412.
  operation, radical, leptomeningitis following, 223.
Meat poisoning, bacteriology of, 289.

MEDICAL NEWS:
  A complimentary dinner to a chirurgeon, 569.
  A medical Ananias club, 183.
  A memorial building to the discoverer of the tubercle bacillus, 526.
  Burrell of Boston, 280.
  Dedicatory exercises of children's department, 134.
  Doctors organize new guild in Detroit, 44.
  Frederick the Great and the doctors, 571.
  Medical department still at Ann Arbor, 472.
  Minor intelligence, 44, 94, 135, 184, 233, 281, 329, 381, 430, 472, 526, 572.
  The career of Doctor Carrier abruptly terminated, 328.
  The demise of an eminent alienist and editor, 134.
  The Michigan dental law, 425.
  The noxious practice of cribbing news, 380.
  The passing of a beloved physician, 90.
  The passing of a distinguished physician, 233.
Medicine, hot and cold applications in, 420.
Medicolegal nuggets, 323.
Melanosarcoma, of the eye, 32.
Meningitis in infancy, 220.
  otitic, 274.
Milk, cow's, in infant diet, the use of citrate of soda as an addition to, 461.
  pure, for infants, 221.
  the mechanical and chemical effect of, on the human, 120.
Miller, Willoughby Dayton, 351.
Mumps, the ocular complications of, 221.
Myelopathic albumosuria, 320.
Myomata cutis, 414.
Myotonia congenita, 226.

N

Narcosis, ether, by rectum, 124.
Nasal obstruction a cause of deafness, 164.
Nephritics, urine of, a mydriatic substance in the, 459.
Nerve irritation and nervous exhaustion, 417.
Nervous system, the action of the Roentgen rays on, 371.
Nodules, multiple, rheumatic, in an adult, 561.
Nurses, the physicians' legal liability for, 228.

O

OBITUARY:
  Arnold, Edmund S. F., 527.
  Barnes, Robert, 185.
  Broadbent, William H., 185.
  Canavan, James F., 383.
  Carrier, Albert E., 328.
  Carroll, Major James, 474.
  Fayrer, Sir Joseph, 233.
  Fletcher, William B., 185.
  Foster, Sir Michael, 139.
  Fuchs, Wolfran C., 95.
  Gairdner, Sir William Tennant, 238.
  Graucher, Professor, 281.
  Hitzig, Eduard, 431.
  Holmes, Timothy, 431.
  Howard, William T., 282.
  Israel, O., 135.
  Kerritt, Markham S., 184.
  Kingsley, Josephine, 431.
  LaCrone, Oliver A., 382.
  Macfadyen, Sir Allan, 136.
  Markoe, Francis H., 475.
  Marsh, William Q., 135.
  Mendel, Emmanuel, 284.
  Miller, Willoughby Dayton, 351.
  Möbius, Paul Julius, 134.
  Osiris, Daniel Iffla, 95.
  Richardson, William Lambert, 282.
  Rinehart, Jacob, 381.
  Rose, Gilbert Lester, 90.
  Schüller, Max, 185.
  Von Jürgensen, Theodore, 235.
  Von Mosetig-Moorhof, Professor Albert, 236.

Obstruction, intestinal, the management of some cases of, 433.
Ocular complications of mumps, 221.
Opsonic amboceptor and complement, separation of, in the cold, 520.
  index, the, as an aid in diagnosis, 375.
  index, phagocytosis in relation to the, 481.
  index, the bacterial suspension in the determination of the, 20.
  serum, on the reactivation of heated normal human, 485.
Opsonin of normal human serum, experiments in favor of the amboceptor-complement structure of the, for the staphylococcus albus, 500.
Opsonins, study of the structure of, 485.
Ophthalmo-reaction in typhoid fever, 375.
  to tuberculin, 320.
  to tuberculin in the early diagnosis of tuberculosis, 276.
Orbit, traumata of the, 26.
Osteomyelitis, in which epithelial sowing was employed, 25.
Otitic meningitis, 274.
Otology and rhinology, practical problems in, 36.

P

Paracentesis of the pericardium, 241.
Paraffin, injections of, 415.
Paralysis, acute spinal, in children, 411.
Paresis, the cerebrospinal fluid in, 373.
  the paradoxic reflex in, 318.
Pemphigus, limited to the mucous membranes, 38.
Pericardium, paracentesis of the, 241.
Peritoneum, hyperemia treatment in tuberculosis of the, 555.
Peritonitis, acute general, 309.
Phagocytosis in relation to the opsonic index, 481.
Pharmacopœia, the United States and the National Formulary, 347.
Phlebitis, otitic, 366.
Pneumonia, 127.
Poliomyelitis, acute anterior, or acute spinal paralysis in children, 411.
Pregnancy and appendicitis, 127.
  extrauterine, appendicitis and, 34.
  tumors of the pelvis during, and their treatment, 125.
Prescription, the rights of the physician to, 467.
Prolapse of the rectum and sigmoid flexure, 465.
Prostatitis, 534.
Pruritus ani, 267.
Pseudomasturbation in infants, 410.
Pulse, venous, interpretation of the positive, 419.

R

Radium for the treatment of cancer and lupus, 562.
Rectal disease, some practical points in the diagnosis of, 337.
  surgery, local versus general anesthesia in, 263.
Rectum, anatomy and physiology of the, 269.
  and sigmoid flexure, prolapse of the, 465.
  the, in its relation to diseases of women, 164.
Reflexes, the influence of the, on the digestive tract, 13.

REVIEWS:

  Abdominal hernia, 576.
    operations, 47.
  A catalogue of medical and surgical books, 480.
  A manual of medicine, 190.
  American practice of surgery, 140, 383.
    Quarterly of Röntgenology, 287.
  A practitioner's handbook of materia medica and therapeutics, 432.
  A study of the human blood-vessels in health and disease, 334.
  A text-book of human physiology, 142.
    on the practice of medicine for students and practitioners, 479.
  Atlas and text-book of human anatomy, 144, 191.
  A treatise on surgery, 96.
    on the principles and practice of medicine, 239.
  Attfield's chemistry, 47.
  Clinical diagnosis, 285.
  Consumption: its relation to man and his civilization; its prevention and cure, 48.
  Die therapeutischen leistungen des jahres, 1906, 432.

REVIEWS (Continued):
  Diseases of the rectum, 335.
  Electrotherapeutics and Röntgen rays, 333.
  Essentials of obstetrics, 336.
  Eye, ear, nose and throat, 238.
  Folia therapeutica, 575.
  Genitourinary diseases and syphilis, 238.
  Green's pathology, 191.
  Handbook of the diseases of children, 96.
  Hare's therapeutics, 528.
  International clinics, 142, 479.
  Modern medicine, 476.
  Operative gynecology, 188.
  Saunders' pocket medical formulary, 575.
  Sutton's tumors, 238.
  Syllabus of lectures on embryology, 576.
  Text-book of comparative pathology, 192.
  The Basel anatomical nomenclature, 143.
  The Harvey lectures, 286.
  The practical medicine series, 288.
  The practice of obstetrics, 333.
  The principles and practice of dermatology, 335.
  The technic of operations upon the intestines and stomach, 575.
  Thornton's pocket medical formulary, 574.
  Tuberculosis as a disease of the masses and how to combat it, 192.
  Wellcome's photographic exposure record and diary for 1907, 287.
  Whitman's orthopedic surgery, 336.
Rheumatic nodules, multiple, 561.
Rhinology and otology, problems in, 36.
Roentgen rays, a unit for measuring, 165.
  rays, an experimental study of the effects of, upon the blood-forming organs, with special reference to the treatment of leukemia, 1, 69, 105.
  the action of, upon nervous system, 371.
Roentgenography, plastic, 559.

S

Sciatica and hemorrhoids, 267.
Sigmoid flexure and rectum, prolapse of the, 465.
Sigmoidopexy, two cases of, 265.
Skiagraphy, the use and abuse of, 416.
Sleep, some organic changes in, 201.
Sphygmomanometer, a new, 419.
Spine, rigid, 128.
Stomach, acute dilation of the, 123.
Stool, the green, 155.
Stridor, congenital, 224.
Surgery, brain, the present status of, 130.
  of the war of 1812, 203.
Surgical practice in vogue seventy-five years ago, 251.
Syphilis of the nose and throat, 299.
  of the throat, 128.
  the treatment of, 370.
Syphilis, Wasserman's reaction in, 561.
Syphilology and dermatology, the need of higher requirements in examinations in, 544.

T

Tibia, partial loss of the, replaced by transfer of the fibula, 362.
Tonsil, the, as a portal of infection, 161.
Tonsils, faucial, facts concerning the, 128.
  faucial, the complete removal of the, 344.
Trachoma, or granular conjunctivitis, 363.
Tuberculin in diagnosis and therapy, 385.
  ophthalmo-reaction to, in the early diagnosis of tuberculosis, 276.
  the cutaneous reaction to, 374.
  the ophthalmo-reaction to, 320.
Tuberculosis cutis—lupus vulgaris, 17.
  of the kidney, 270, 310.
  of peritoneum, hyperemia treatment in, 555.
  ophthalmo-reaction to tuberculin in the early diagnosis of, 276.
Tuberculous bursitis, bilateral, of hips, 557.
Tumor, intracranial, 319.
Tumors of the pelvis during pregnancy, 126.
Turbinal, the middle, 368.
Typhoid, a fatal case of, 145.

U

Ulcer, duodenal, the diagnosis of, 227.
Urine of nephritics, a mydriatic substance in the, 459.
Uterine cancer, 359.
  prolapse and cystocele, 556.
Uterus, cancer of the, 359.

V

Ventrosuspension of the uterus, Cesarean section following, 529.
Von Recklinghausen's disease, 24.

W

Whooping-cough, leukocytosis in, 220.

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ORIGINAL ARTICLES.

MEMOIRS.

AN EXPERIMENTAL STUDY OF THE EFFECTS OF ROENTGEN RAYS UPON THE BLOOD-FORMING ORGANS, WITH SPECIAL REFERENCE TO THE TREATMENT OF LEUKEMIA.

ALDRED SCOTT WARTHIN, PH. D., M. D.
PROFESSOR OF PATHOLOGY AND DIRECTOR OF THE PATHOLOGICAL LABORATORY AT THE UNIVERSITY OF MICHIGAN.

PART I.—HISTORICAL.

A PRELIMINARY report of this investigation was presented in April, 1905, at the Chicago meeting of the Association of American Pathologists and Bacteriologists. Its publication was, however, delayed until January, 1906, although received for publication June 15, 1905. Under the conditions of its appearance in the bound volume of "International Clinics" its circulation was necessarily somewhat limited, and many requests have been made for its reprinting. To this the publishers of the monograph have kindly consented, and in the reprinting it has been thought wise to bring the article up to date. To the original matter there has been added a complete survey to the present time of the literature concerning the effects of Roentgen rays upon the tissues and the use of Roentgen irradiation in the treatment of leukemia and related conditions. The article has also been further extended and its interest increased by a pathologic study of two additional cases thus treated.

Although a decade has barely elapsed since Roentgen's announcement of his discovery (November, 1895), we have seen during this relatively short period a most remarkable activity in the application of the Roentgen rays along clinical lines, both diagnostic and therapeutic.

From the nature of the discovery it was natural that the first development should be largely photographic, and x-ray pictures were almost immediately utilized in the diagnosis of foreign bodies, fractures, dislocations, skeletal anomalies and abnormalities, bony tumors, calcified blood-vessels, calculi, et cetera. Later the same method was applied to the diagnosis and study of diseased conditions of the internal organs: aneurysm, and various cardiac, pulmonary, and gastrointestinal conditions. The known bactericidal action of light led to a very natural attempt to establish a similar property on the part of the new rays, particularly with reference to bacteria within the body or the body-tissues. The rays were, therefore, applied to the treatment of conditions known to be of bacterial origin, as well as of others for which a bacterial origin is as yet only adduced.

In the course of these two very natural medical applications of Roentgen rays, it was soon discovered that the exposure of the skin to the prolonged action of the rays was in some cases followed by depilation and degenerative and inflammatory changes somewhat analogous to severe burns. Partly because of a hoped-for bactericidal action, partly because of the inflammatory and necrotic processes set up in the skin, and partly also for reasons purely empirical, the new rays were in turn soon applied to the treatment of carcinoma, lupus, and other affections of the skin. Such treatment was gradually extended empirically or experimentally from the clinical side to nearly every form of skin lesion, and Roentgen-ray treatment has at the present time acquired a very prominent position in dermatologic practice. A similar development took place to a lesser degree in surgery and gynecology in the application of the rays to the treatment of tumors, both malignant and benign. The discovery of the analgesic action of the rays led also to their employment in the treatment of certain nervous conditions. Finally, because of their supposed bactericidal action, and again for purely empirical reasons, the Roentgen rays have recently been applied to the treatment of leukemia and pseudoleukemia, with results so extraordinary as at once to challenge attention and investigation.

With all of the remarkable activity displayed in the clinical application of Roentgen rays but little has been done in the study of the tissue-changes produced by Roentgen irradiation, and our knowledge of such changes is very slight indeed. Such information as we do possess is for the chief part the result of incidental, or even accidental, observations, and but very few experimental investigations of the effects of Roentgen rays have as yet been carried out. The field apparently has not proved an attractive one to pathologists, probably for the reason that so much of the clinical experimentation was purely empirical, and the therapeutic results so contradictory or dubious. Naturally the earliest pathologic observations of Roentgen-ray action were concerned chiefly with the changes in the skin structures in the so-called "burn," later with those occurring in carcinoma and lupus when so treated, and only very recently have they been extended to changes occurring in the internal organs, particularly the blood-forming organs and the sexual glands. All told the number of such observations is very small, and of them but two or three alone deserve the name of scientific research. Inasmuch as no complete analysis of these observations exists in the literature it will be worth while to attempt that here.

Marcuse,[1] in 1896, made probably the first microscopic examination of the effects of Roentgen irradiation. In a case of Roentgen-ray alopecia and dermatitis he examined microscopically the hairs, and found signs of degeneration in those falling out. The root of the hair was fibrillated, the sheath swollen, the characteristic cupping at the base absent, and in the shaft the outlines of structure were entirely gone, the line of the medulla being completely lost. Such hairs were unusually clear and shining, and showed at intervals deep constrictions.

In the same year Park,[2] Minck,[3] Lyon,[4] Delepine[5] and others studied the effects of the rays upon bacteria. Their results were negative—no inhibitory or bactericidal action could be demonstrated.

Gilchrist,[6] in 1897, examined portions of skin taken from the fingers of a case of *x*-ray dermatitis. No foreign particles were found in the tissues, and the pathologic picture presented was that of a chronic inflammation. The horny layer was thickened, partly detached, and contained a large number of brown pigment granules in the exfoliating portion. The mucous layer was not thickened but was pigmented to a greater extent than normal. The vessels of the corium were dilated, and the number of pigment cells in the upper layers was almost as great as in the skin of a negro.

Tarkhanoff[7] experimented with frogs, mice, guinea-pigs, rabbits, and birds. He found that after prolonged irradiation the animals died with paralytic symptoms. The reflexes were inhibited. He also noted an increased pigmentation of the skin in the frogs exposed.

Oudin, Barthélemy and Darier[8] made an experimental study of Roentgen-ray alopecia in guinea-pigs. They found a great thickening of all the layers of the epidermis, especially the horny layer, the individual cells, however, appearing little altered. The hair-follicles and glands showed a nearly complete atrophy, only traces of them being found. No changes were observed in either the large or small blood-vessels, or in the nerves of the cutis or subcutis.

Kibbe[9] made a microscopic examination of a piece of skin excised from an *x*-ray burn. The horny layer showed no changes, the epithelial

[1] *Deutsche medizinische Wochenschrift, XXII, 1896.*

[2] *Medical News, 1896.*

[3] *Münchener medizinische Wochenschrift, 1896.*

[4] *Lancet, 1896.*

[5] *British Medical Journal, 1896.*

[6] *Johns Hopkins Hospital Bulletin, 1897.*

[7] *Gazetta degli ospedali, 1897.*

[8] *Monatshefte für praktische Dermatologie, XXV.*

[9] *New York Medical Journal, 1897.*

cells of the other layers presented evidences of degeneration, the nuclei undergoing disintegration. The formation of keratohyalin was greatly increased. In the corium there were evidences of a mild inflammation, most marked about the hair-follicles.

Lopriore[10] experimented on plants, and found an inhibition of pollen germination. After the exposure the germination began again, but during the exposure the pollen granules took up large amounts of water.

In 1898 Rodet and Bertin[11] observed the effects of Roentgen irradiation on animals, finding in those exposed a condition of paralysis and convulsions ending fatally. On autopsy they found a meningomyelitis to which they attributed the symptoms.

In the same year Unna[12] examined a piece of human skin taken from an area several times exposed, but showing only slight reddening and pigmentation. He found that the collagenous tissue no longer reacted normally to certain stains but had become basophile. He regarded this change in the collagen as degenerative in kind, and advanced the hypothesis that this degeneration slowly excited an inflammatory reaction.

Jutassy[13] (1899) found in an irradiated rabbit exactly the same changes as those observed in the guinea-pig by Oudin, Barthélemy and Darier.

Gassmann[14] made a microscopic study of a deep Roentgen-ray ulcer. He found the upper part of the ulcer to consist of structureless wholly necrotic masses, and heaps of cocci, while in the deeper layers he found unstained fibrillated masses, nuclear remains, fragments of connective-tissue bundles and great numbers of leukocytes. Deeper still the tissues gradually became normal. The most striking changes were those in the large vessels of cutis and subcutis, and consisted of a degeneration of the intima and muscularis characterized by vacuolization. Gassmann believed that the vessel changes formed the essential cause of the *x*-ray ulcer and of its slow healing.

Schaudinn[15] found that amebæ exposed to the Roentgen rays soon became spherical and smooth, imbibed water, and became greatly swollen. The ectoplasm finally became so stretched as to burst in an explosive manner. At the end of ten hours all the amebæ were changed into small heaps of granules.

In 1900 Startin[16] made a microscopic examination of the hair-roots and sheath in Roentgen-ray alopecia, and found them to show a "drying up."

Rollins[17] (1901) found that two hours daily exposure for eleven days caused the death of guinea-pigs. In the same year Lion[18] studied the changes in irradiated skin and in Roentgen-ray ulcers, describing vacuolization, endothelial proliferation, et cetera. He found no marked changes in irradiated lupus-tissue. Kienbock[19] exposed experimentally guinea-pigs and mice. The marked nervous symptoms produced in the latter were attributed to an inflammation of the central nervous system. No histological examinations were made.

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[10] Cited by Schaudinn (15).

[11] *Gazetta des Hopitaux, 1898.*

[12] *Deutsche medizinische Zeitung, 1898.*

[13] *Fortschritte auf dem Gebiete der Röntgenstrahlen, 1899.*

[14] Ibidem, 1899.

[15] *Archiv für die gesammte Physiologie, 1899.*

[16] *Lancet, 1901.*

[17] *Boston Medical and Surgical Journal, 1901.*

In 1902 Scholtz[20] made an important study of the effects of Roentgen rays upon the skin, using young swine. He concluded that the rays affect chiefly or exclusively the cellular elements, causing a slow degeneration of these, while the connective-tissue elements are only secondarily involved in the inflammatory reaction. He found a similar degeneration to occur in irradiated lupus-tissue, and ascribes the favorable results of such treatment to the inflammatory reaction. Degeneration of cancer cells was also seen in irradiated carcinoma of the skin. Slight changes were seen in leprosy and mycosis fungoides. In psoriasis an almost complete disappearance of typical psoriasis changes occurred after irradiation. Peculiar pigmentation of both diseased and sound skin was noticed.

In the same year a number of other writers made some contributions to the histology of Roentgen-ray changes in the skin and in neoplasms. Rudis-Jicinsky[21] experimented with guinea-pigs and rabbits, studying microscopically the changes in the "burn." He found evidences of an especial inflammatory reaction with development of fibrous tissues, thickening of the vessel walls and contraction of their lumina. As a result of the impaired blood supply degenerative changes are set up. Veliaminoff[22] makes the statement that Glebovski made microscopic examinations in cases of lupus and rodent ulcer treated by Roentgen rays, and found an increase of fibrous and elastic tissue with fatty degeneration of lymphoid and giant cells. Pusey[23] found a peculiar degenerative process in irradiated carcinoma masses, the cells losing their contour and nuclei, and becoming a structureless, hyaline mass staining a faint blue with hematoxylin. Walker[24] reported a "fibromyxomatous degeneration" of a rodent ulcer healing under Roentgen-ray treatment. Beck[25] reported a "colloid degeneration" of an irradiated adenocarcinoma, similar changes being found also in the skin covering the tumor. He also noted a thickening of the intima of the small vessels due to a new formation of reticulated fibrous tissue. Mayou[26] describes changes occurring in rodent ulcer after irradiation, finding inflammation of the corium, and vacuolization and necrosis of

[18] "Congress der deutschen dermatologischen Gesellshaft," 1901.

[19] *Wiener medizinische Presse, 1901.*

[20] *Archiv für Dermatologie und Syphilologie, LXIX.*

[21] *New York Medical Journal, 1902.*

[22] *Russki Vratch, 1902.*

[23] *Journal of the American Medical Association, 1902.*

[24] *British Medical Journal, 1902.*

[25] *New York Medical Journal, 1902.*

[26] *British Medical Journal, 1902.*

the epithelioid cells. On the other hand Shattock[27] examining a mammary carcinoma treated by Roentgen rays found no changes attributable to the treatment. Loeb[28] in the study of transplanted sarcoma in the rat found that irradiation had no effect upon mitosis, the tumor continuing to grow after repeated exposure. Degenerative changes were present in the center of the growth, but could not with certainty be ascribed to the action of the rays. Herzog[29] also treated transplanted sarcoma in rats. The skin over the tumors became necrotic, and in one case the growth became converted into a cyst filled with a clear fluid, and finally sloughed away leaving a clean surface. McCaw[30] observed a "colloid degeneration" of the epithelial cells of a primary epithelioma of the soft palate and uvula. No colloid material was found in the growth when examined before the treatment with the rays. Pernet[31] made a microscopic study of lupus tissue six months after treatment with Roentgen rays, finding some disintegration of the collagen, destruction of the greater part of the elastin, disintegration and infiltration of the sweat glands, absence of sebaceous glands and hair follicles, thickening of the blood-vessel walls, and a fibrous change in the upper layers of the corium. Rieder[32] claimed an inhibition of a growth and a distinctly bactericidal action in cultures of bacteria. Sequeira[33] saw in the epithelial cells of a cancer treated by irradiation a "lysis" of both nucleus and protoplasm and a fatty degeneration.

In 1903 Stewart[34] reported fatty degeneration and vacuolation of the epithelial pearls of an epithelioma treated by Roentgen rays. A leukocytic infiltration was also present and a great increase of bodies similar in all respects to Plimmer's bodies. Albers-Schönberg[35] made experimental exposure of rabbits and guinea-pigs, and found that after several hours irradiation the animals showed necrospermia and azoöspermia, these conditions persisted for a long while and perhaps permanently. Frieben[36] using the same animals found the spleen normal, the testicles atrophic and the epithelium of the tubules lost, without evidences of inflammatory processes. Ellis[37] studied microscopically the changes occurring in tumors treated by Roentgen rays. He found necrosis of cells and trabeculæ, fatty degeneration, increase of elastic tissue, lymphocytic infiltration, absence of polymorphonuclear leukocytes, and a tendency to the obliteration of vessels through deposits on their intimas. Exner[38] found also evidence of an irritation of the con-

[27] *British Medical Journal, 1902.*
[28] *Journal of Medical Research, 1902.*
[29] Ibidem, 1902.
[30] *New York Medical Journal, 1902.*
[31] *Lancet, 1902.*
[32] *Münchener medizinische Wochenschrift, 1903.*
[33] *British Medical Journal, 1902.*
[34] *Journal of the American Medical Association, 1903.*
[35] *Münchener medizinische Wochenschrift, 1903.*
[36] Ibidem.
[37] *American Journal of the Medical Sciences, 1903.*
[38] *Wiener klinische Wochenschrift, 1903.*

nective tissue. Mikulicz and Fittig[39] examined a portion of a mammary gland carcinoma four weeks after the beginning of the irradiation, and found scarcely a trace of carcinomatous tissue, with the exception of a few cells or nuclei arranged in an alveolar manner, and perhaps to be interpreted as giant-cells. Heineke[40] experimented upon mice and small guinea-pigs, and found that they died in from seven to eleven days after being exposed to the rays for several hours. The histologic changes consisted chiefly of excessive pigmentation of the spleen, disappearance of the splenic follicles, and a widespread rarefaction of the cellular elements of the splenic pulp. Gottwald Schwarz[41] experimented with the eggs of the sea-urchin and found no evidnces of inhibition of growth as the result of irradiation.

In this same year Perthes[42] conducted a series of animal experiments and also studied the microscopic changes in irradiated carcinoma, skin warts, and freshly granulating wounds. He found that irradiation of one wing of a young chick caused a marked inhibition of growth, the irradiated wing remaining far behind the other in its development, both bones and feathers being affected. In healing wounds he found that irradiation caused a slowing of epithelial regeneration and a delay in cicatrization. The microscopic changes in irradiated carcinoma consisted of an especial action upon the cancer cells as shown by degeneration and necrosis, the action upon the connective tissue cells being much less intense. Perthes refers also to the work of Joseph and Prowazek,[43] who found that certain organisms (Paramecium, Daphnia) showed a negative tropism toward the Roentgen rays. Certain changes were observed in the plasma of paramecia which could be interpreted only as of the nature of an injury or exhaustion.

In carcinoma treated by x-rays Mayo[44] found a large number of leukocytes and dilated vessels. Newcomet[45] found only slight degenerative changes in the cells of carcinoma treated by Roentgen rays.

In 1904 Gassmann[46] studied the histology of an x-ray ulcer in the rabbit. He found a formation of clefts between the muscle cells of the vessel walls, the intima thickened, and the lumina contracted. A cellular infiltration was present about the perineurium of the nerve-trunks. The fibrous connective-tissue bundles were broken up and surrounded by a cellular infiltration made up of plasma-cells and leukocytes.

Gilman and Baetjer[47] found that the eggs of Amblystoma developed abnormally under Roentgen-ray irradiation, the resulting embryos showing no external mouths. Chicks developed in eggs exposed to the rays showed malformations of the occipital region and extremities, the feathers being abnormally distributed in patches over the body.

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[39] Cited by Perthes (42).
[40] *Münchener medizinische Wochenschrift, 1903, 1904.*
[41] *Wiener klinische Wochenschrift, 1903.*
[42] *Archiv für klinische Chirurgie, LXXI.*
[43] Cited by Perthes (42).
[44] *Wiener klinische Wochenschrift, 1903.*
[45] *Medical News, LXXXIV, 1904.*
[46] *Archiv für Dermatologie and Syphilologie, 1904.*
[47] *American Journal of Physiologie, 1904.*

Scholz,[48] Seldin,[49] and Philipp[50] have confirmed the production of azoöspermia in animals and in man by means of Roentgen irradiation.

Birch-Hirschfeld[51] found in irradiated rabbits a necrosis of the ganglion-cells of the retina, and a secondary atrophy of the optic nerve.

Seldin,[52] in later experiments, found in exposed white mice dying with paresis of the posterior extremities, an intense injection of the meninges. In larger animals these changes were not present. The liver-tissue in all cases was normal.

Baermann and Linser[53] studied the changes produced by the Roentgen rays in lupus-tissue. They concluded that the essential changes are to be found in an endarteritis and contraction of the blood-vessels with degenerative changes in the connective tissue, and that the epithelium is not primarily affected. They supported these views in a second paper. They also found no changes in irradiated blood and blood-corpuscles. The irradiation of red corpuscles did not affect the hemolytic power of hemolytic serums, nor did it change those not hemolytic. On the other hand the irradiation of serums caused a decrease of hemolytic power toward nonirradiated solutions of blood corpuscles. They also established the very important fact of a marked increase in the nitrogen output as a result of irradiation.

Milchner and Mosse[54] confirmed the resistance of red corpuscles to Roentgen rays. In irradiated rabbits (three to four hours exposure) they found intense changes in the bone-marrow as shown by signs of degeneration in the white cells, both of the lymphoid and myeloid series, while the red cells were preserved. Grawitz[55] found also a diminished resistance of the leukocytes to hypertonic solutions as the result of Roentgen-ray treatment of a case of leukemia. On the other hand, Joseph and Kurpjuweit[56] found essential changes in the red corpuscles in the blood from a leukemic patient exposed *in vitro* for thirty minutes, as compared with a control. Aubertin and Beaujard[57] found that the irradiation of leukemic cases caused first an increase in the number of white cells and then a fall below the original number. After repeated exposures this increase did not occur and the fall took place at once.

In this same year appeared the important work of Heineke,[58] first as a preliminary communiction and later as a final report. His research is by far the most important contribution to Roentgen-ray pathology. He studied experimentally the effects of Roentgen-ray irradiation of small and large rabbits, white mice, guinea-pigs, and dogs, and found in all conclusive evidence of an elective action of the rays upon the lymphoid tissues of the spleen, lymph-glands, and bone-marrow. All mice exposed for more than five hours died within three to eleven days. The autopsies showed great emaciation, intestines distended and filled with fluid contents, spleen very small, dark pigmented and showing no follicles. The microscopic examination of the spleen and lymph-glands showed an extensive destruction of lymphocytes, both in the pulp and follicles, also of the giant-cells (mice), polynuclear leukocytes and probably the eosinophiles also. In the bone-marrow there was a rarefaction of the specific cells. The spleen, bone-marrow, and lymph-glands ultimately became very poor in cells. There was also a marked collection of pigment and phagocytes containing red cells and pigment in the spleen and lymph-glands. These changes were found in all the lymphoid tissues of the body, intestinal follicles, thymus, et cetera. A latent period was not found. The changes were transitory, regeneration quickly taking place.

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[48] *Deutsche medizinische Wochenschrift, 1904.*

[49] *Fortschritte auf dem Gebiete Röntgbestrahlung, Band VII, 1904.*

[50] Ibidem.

[51] *Münchener medizinische Wochenschrift, 1904.*

[52] "Dissertation," Königsberg, 1904.

[53] *Münchener medizinische Wochenschrift, 1904.*

[54] *Berliner klinische Wochenschrift, 1904.*

[55] *Referate Berliner klinische Wochenschrift, 1904.*

[56] *Deutsche medizinische Wochenschrift, 1904.*

[57] *Presse Médicale, 1904.*

[58] *Mittheilungen aus der Grenzgebieten der und medizin Chirurgie, 1904.*

In 1905 Halberstaeder[59] reported observations on the effects of Roentgen rays upon the ovaries. He found them much more sensitive to the rays than the skin, and more so than the testicles. The irradiated ovaries showed great reduction in size.

Vose and Howe[60] studied the effects of Roentgen rays in 120 cases of cancer. From their microscopic examinations they conclude that cutaneous cancer treated by Roentgen rays undergoes a degeneration not peculiar to this form of treatment or distinguishable from degeneration from other causes. The vascular changes are limited to an endarteritis; new formation of blood-vessels occurs if healing takes place, as in the process of repair elsewhere; there is an increase of elastic tissue. Mitoses are less abundant after treatment.

Quadrone[61] studied the urinary changes resulting from Roentgen irradiation. He found an increased excretion of uric and phosphoric acids. He explains the general symptoms occurring after repeated or prolonged exposures as an intoxication resulting from cell-disintegration.

Gramegna and Quadrone[62] have shown that, aside from a slight decrease in physical resistance, the red blood cells are not affected by Roentgen irradiation. Hemoglobin is not altered. Both mononuclear and polynuclear leukocytes are diminished in number, and both nuclei and protoplasm show fragmentation and degeneration. An increase in the specific density and coagulability of the blood was also noted.

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[59] *Berliner klinische Wochenschrift, 1905.*

[60] *Journal of Medical Research, 1905* ("Report of Cancer Commission").

[61] *Centralblatt für innere Medicin, 1905.*

[62] *Archives Général de Médicine, 1905.*

Schultz and Hoffman[63] found degeneration and necrosis in the kidneys of guinea-pigs drawn outside of the body and exposed to Roentgen rays. This work is not at all convincing, the effects of the operation not being eliminated.

Brigante-Colonna[64] carried out an important series of experiments to determine the effect of Roentgen irradiation upon an artificially produced leukocytosis. Exposures in normal animals had no effect upon the number of leukocytes in the blood. In dogs exposed after subcutaneous injection of turpentine but before the formation of an abscess the production of leukocytes was inhibited, the number of white cells falling to 4,000, while in control animals the number of neutrophile polynuclear cells rose from 8,000 to 28,000. In animals irradiated after the leukocytosis had been thoroughly established the rays diminished leukocytosis at its acme. No alteration in the number of the mononuclears was seen the polynuclears alone being affected.

Calabrese[65] found that irradiation of the virus of hydrophobia does not alter the potency of the virus of rabies.

Bibergeil[66] found that irradiation produced no differences in the action of toxic coloring agents on blood from normal and leukemic individuals.

Bardeen[67] found that spermatozoa die sooner under the action of Roentgen rays than when not exposed. When exposed so long that the majority lose the power of fertilization the eggs thus fertilized usually do not develop into larvas. When exposed for some time but when still capable of fertilizing, the eggs so fertilized appear to develop normally at first but beyond the gastrula stage development becomes retarded and the resulting larvas are deformed. Bardeen concludes that nuclear material may be so influenced by exposure to the Roentgen rays that after a latent period it will call forth marked abnormalities in development. Further, that injury to spermatozoa capable of fertilizing ova may cause the development of monsters from the ova thus fertilized.

Fellner and Neumann[68] confirmed the occurrence of marked changes in ovaries of irradiated animals.

Milchner and Mosse[69] confirmed the selective action of Roentgen rays upon the leukocytes, but could not determine with certainty the production of a leukotoxin.

Foersterling[70] noted inhibition of development in young animals exposed to ordinary therapeutic doses of irradiation. He warns against the dangers of irradiation in young children.

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[63] *Deutsche Zeithschrift für Chirurgie, 1905.*

[64] *Il Policlinico, 1906.*

[65] *Presse Médicale.*

[66] *Wiener klinische Therapeutische Wochenschrift, 1906.*

[67] *American Medicine, 1906.*

[68] *Fortschritte auf dem Gebiete der Röntgenstrahlen, 1906.*

[69] *Berliner klinische Wochenschrift, 1906.*

[70] *Centralblatt für Chirurgie, 1906.*

Ross[71] found no effects resulting from prolonged exposures of trypanosomes.

Hartzell[72] studied the microscopical changes in a case of Paget's disease treated by prolonged Roentgen irradiation. Disappearance of the plasma-cell infiltration, deposit of pigment in the corium and disappearance or atrophy of the glandular structures were the changes regarded as the direct result of the treatment.

Warthin[73] studied experimentally the changes produced in the kidneys by Roentgen irradiation. He found transitory nuclear changes after slight exposures and more marked changes after prolonged ones. In the kidneys of leukemic patients treated by Roentgen irradiation there were found extensive deposits of lime-salts in connection with atrophy and degenerative changes.

Capps[74] believes that he has demonstrated the presence of a leukotoxin in the serum of animals exposed to the action of Roentgen rays.

Exner and Sywek[75] believe that the changes produced in the spleen and lymph-glands by Roentgen irradiation can be duplicated by injections of cholin. They regard the action of the rays as being of the nature of that of a corrosive substance.

The above abstracts represent the sum total, in so far as my search of the literature has been able to go, of our knowledge concerning the action of Roentgen rays upon the body-tissues. It will be noted that the greater part of these observations are concerned with the changes produced in the skin. With the exception of the recent work of *x*-ray effects upon the sexual glands and Heineke's important studies of the changes produced in lymphoid tissues, we are practically ignorant of the action of Roentgen rays upon the deeper tissues and organs of the body. During the first five years of clinical work with the *x*-rays it has been somewhat strenuously denied by a number of prominent *x*-ray workers that the Roentgen rays have any effect upon the internal organs. Evidence has, however, been slowly accumulating to the effect that aside from the purely local action, Roentgen irradiation may produce changes in the internal organs. Cases of disturbances of the general condition of the body after irradiation have been reported by Freund,[76] Gocht,[77] Oudin,[78] Sequy and Quenisset,[79] Walsh,[80] Kienbock,[81] Baermann and Linser,[82] Holzknecht,[83] and others. These general disturbances may be grouped together as: fever, headache, dizziness, insomnia, restlessness, cardiac palpitation and irregularity, gastric pain, et cetera.

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[71] *British Medical Journal, 1906.*

[72] *Journal of Cutaneous Diseases, 1906.*

[73] "Transactions of the American Roentgen Ray Society." 1906.

[74] "Transactions of the Association of American Physicians," 1906.

[75] *Fortschritte auf dem Gebiete der Röntgenstrahlen, 1906.*

[76] *Wiener medizinische Presse, 1901.*

[77] "Handbuch für Röntgenlehre."

[78] *Monatschefte für pracktische Dermatologie, XXV.*

[79] *Bulletin Academie des Sciences, 1897.*

[80] *British Medical Journal, 1897.*

[81] *Wiener medizinische Presse, 1901.*

[82] *Münchener medizinische Wochenschrift, 1904.*

[83] *Wiener klinische Wochenschrift, 1902; Wiener klinische Rundschau, 1902.*

Edsall[84] recently warned against the dangers of Roentgen irradiation, and mentions an instance of a fatality following such treatment. The analgesic effects in certain cases may also be classed here. Noted at first as only incidental, and regarded as probably accidental, no attempt was made to investigate these phenomena. Only very recently have they been approached by the way of animal experimentation, and some attempt at a solution of the problem has been carried out. So far these experiments have shown that small animals may be killed by the rays, and that severe general disturbances may be produced in larger animals, the symptoms in general being paresis, loss of appetite, emaciation, somnolence, coma, et cetera,—in fact, the symptoms of a severe intoxication. The experiments of Rodet and Bertin, Kienbock, Heineke, and Baermann and Linser have proved conclusively the importance of the internal effects of Roentgen irradiation, and point the way to a solution of the clinical phenomena mentioned above, and to a better therapeutic understanding.

The publication in 1903 (Senn[85]) and the first half of 1904 (Brown,[86] Bryant and Crane,[87] et cetera) of reports showing most remarkable results in the treatment of leukemia by Roentgen-ray irradiation, and the fact that such results had at that time no pathologic explanation, and as they promised to throw some light upon the pathology of leukemia and possibly also upon the origin of the various forms of white cells led to the planning of this work early in the summer of 1904. Heineke's first report (1903) had appeared but was then unknown to me, and the experimental part of this investigation had been largely carried out before his complete study was published. Although repeating many of his experiments my results are of importance not only in confirming his work, but because they offer much in addition to his observations and conclusions, the microscopic study having been carried farther. Further, having access to autopsy material of five leukemic patients treated by Roentgen rays, I have been able to make a detailed study of the changes in the pathologic picture of leukemia resulting from such treatment, and to arrive at some conclusions regarding the nature of the action of the *x*-rays in this disease and of its therapeutic worth. These conclusions it may be said in the beginning are opposed to Heineke's view that Roentgen-ray treatment might prove of value in diseases of the lymphoid tissues, particularly leukemia and pseudoleukemia. Further, this research has added to our general knowledge of Roentgen-ray pathology and offers strong evidence of the occurrence of an intoxication caused by the disintegration of cells by the rays. [TO BE CONTINUED.]

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[84] *Journal of the American Medical Association, 1906.*

[85] *New York Medical Journal, 1903.*

[86] *Journal of the American Medical Association, 1904.*

[87] *Medical Record, 1904.*

THE INFLUENCE OF THE REFLEXES ON THE DIGESTIVE TRACT.*

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No fact of clinical observation concerning the human organism appeals to us more strongly than the interdependence of its parts. Complicated as is the human body, and specialized and perfect as its several structures and organs are, it is after all an undivided whole—the end result of a most magnificent development of a single cell.

It is for this reason that in a study of the digestive tract, for instance, our attention should be drawn beyond and away from it to remote parts in the search for the explanation of certain phenomena.

To illustrate, let me narrate the following histories:

Mrs. D., age thirty, came to me complaining of anorexia, indigestion, shortness of breath, menorrhagia at times, and loss of weight. Her sickness had extended over a period of three years, during which time she had been treated chiefly for catarrh of the stomach. She had a sallow complexion, gave evidence of having lost twenty-five or thirty pounds in weight, and presented an anxious expression of countenance. Without enumerating unnecessary detail, let it be said that thorough examination disclosed a fibroid tumor of the uterus of the size of a cocoanut. Abdominal hysterectomy was performed. The patient returned to her home at the end of three weeks to complete a most satisfactory convalescence. There has been since then no evidence of any independent gastric disease.

C. R., a man of forty-five years, was seized suddenly with severe tearing pains in the right lumbar and inguinal regions, projecting downwards along the genitourinary tract. The scrotum was exceedingly tender and the right side considerably enlarged, being distended with the contents of a hernia, which had existed about three years. With some difficulty the hernia was reduced, after which marked relief was experienced. A diagnosis was made of renal colic and the patient was directed to note the urine. He reported later that on the day following the seizure he passed a stone the size of a bean.

Mrs. A. C., age thirty-eight, mother of two children, telephoned me one evening that she was suffering from indigestion. She said it was unnecessary for me to call, and yet she wished to know what simple remedy she should use. Not long after a similar telephone message was received at 11 P. M. I insisted upon seeing her and found only slight tenderness upon deep palpation over the region of the gall-bladder. I expressed my suspicion of gall-bladder disease and remarked that operation might sometime be necessary. Within another fortnight she had still another attack of nausea, abdominal discomfort but not severe collicky pain, and seemed generally miserable. This attack did not quickly pass over. The patient became discouraged, and, fearing an operation, changed doctors. Six months later I was again called to see this patient. A month previously she had been sent to the White Mountains to secure relief from malaria, but unfortunately had been seized, the day after her arrival at a farm house, with a severe attack of cholecystitis, with cholangitis, and profound jaundice. She made her own plans for an operation. The gall-bladder was found to be densely adherent on all sides. The fundus was divided transversely by a partition and longitudinally by an hour-glass contraction. The walls of both cystic duct and choledochus were thickened, the ampulla was enlarged and soft stones were removed from every portion of the biliary tract from the fundus of the gall-bladder to the duodenum.

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*Read before the DETROIT MEDICAL CLUB.

Having pointed out and illustrated the fact of reflex disturbances in the digestive tract, it concerns us now to inquire into their nature, operation and diagnosis.

Descartes is said to have introduced the conception of reflexes into biologic literature.

In this paper the specific use of the term reflex, as in knee and plantar reflexes, has not been constantly in mind. Our use of it would include the broader meaning, as in reflex spasms, and even the freest use of it, as in reflex neuralgias. The last named may be said to be not genuine reflexes, but rather an irradiation of a sensory stimulus to other parts or branches of the peripheral sensory apparatus of the affected locality.

The genuine reflex phenomena are regarded as consisting of neural stimulation that is reflected from one set of neurones (centripetal neurones) to a physiologically different set of neurones (centrifugal neurones).

The other type consists of a neural stimulation that is irradiated and propagated from one set of neurones (centripetal) to another physiologically homologous set (centripetal neurones).

The term reflex is, however, used promiscuously in medical literature to denote a phenomenon, the cause of which operates at some distance from where its effects are manifest.

Reflex disturbances are organic and functional. The former are much less frequent than the latter and are usually the results of long continued functional disease. Pathologically they are hypertrophic and hyperplastic, due to passive congestion; or atrophic, dependent upon functional anemia or suspension. As examples of organic diseases of such character may be mentioned respectively benign pyloric stenosis due to hypertrophy of the fibrous and muscular tissues, and gastric ulcer consequent upon anemia and hyperacidity. In the pelvis, too, structural changes in the rectum, such as dilated hemorrhoidal veins, may be observed often, the effect of a retroflexed uterus.

Functional disturbances of the digestive tract of reflex origin are both more numerous and less serious usually than organic diseases from the same source. They relate to every physiologic feeling and act from the appetite to defecation.

We do not know exactly how the sensation of appetite is induced. It is a nervous phenomenon associated with the brain and understood to depend in some way on the conditions of the stomach. In health it is a definite indication of the caloric requirements. However it may be brought about we know that anorexia or diminished appetite results from gastric causes such as motor insufficiency, gastritis, cancer, atrophy of the glands, ulcer, from nervous causes as past association, nauseous tastes, smells, shock, grief, worry, excessive mental exercise, insanity, and gastric neuroses, and from constitutional conditions as tuberculosis, fevers, anemias, cachexias, excessive physical exercise, and poisons.

On the other hand boulimia or increased appetite for food may depend upon hyperacidity or some neurosis, and polyphagia or excessive eating is to be observed associated with intestinal worms, some brain tumors, sexual disorders, and convalescence from some fevers as typhoid.

Deglutition may be functionally difficult on account of diminished appetite, from fear of pain on account of gastric ulcer, and from certain nervous conditions as hysteria.

To consider the reflex disturbances of the stomach, vomiting is induced in bronchitis, tuberculosis, and emphysema. in pharyngitis, with gall-stones and renal calculi, especially with great pain, in strangulated hernia, genitourinary diseases, toxemias, pregnancy, in severe infectious diseases in children, in metallic poisoning, with great pain anywhere in the body, and many other conditions.

Among the causes of motor insufficiency should be mentioned in this connection the wearing of improper clothing, prolonged sedentary habit, constitutional diseases, as chlorosis, anemia, tuberculosis, typhoid fever, grief or great anxiety.

Hyperchlorhydria is a condition almost always brought on as a neurosis or as a reflex irritation. Among the causes are chlorosis, neurasthenia, melancholia, worry and excitement, and it is often associated with the excessive use of tobacco, renal calculi, cholethiasis. and migraine.

Gastritis may be secondary to the infectious diseases, as measles, scarlatina, erysipelas, pneumonia, acute nephritis, and some diseases of the lungs and intestines. Howeyer, these are not always of a reflex character.

Atrophy of the mucous membrane may be associated with pernicious anemia, and cancer in remote parts of the body.

The normal intestinal movements are of two types—the true peristaltic wave of contraction, and the swaying or pendular movements, which are identical in rhythm with contractions of the wall taking place at a much more frequent rate than those concerned with true peristalsis. In addition to these a very pronounced and much more rapidly progressive wave has been observed under certain circumstances, such as exposure of the gut to cold, anemia of the intestines, or presence of gaseous contents to which the name of vermicular contraction has been given. Bayliss and Starling consider this a pathologically intensified form of that type of contraction which causes both the pendular movements and ordinary rhythmical contraction.

Technically speaking intestinal movements are coordinated by the local nervous mechanism, but control is exercised through the central nervous system, chiefly through the vagi and splanchnic nerves. Stimulation of the vagi increases peristaltic movements, while stimulation of the splanchnics diminishes rhythmic movements. It is doubtless through the channel of the vagi that an evacuation is sometimes produced soon after the taking of food, and owing to stimulation of the splanchnics by various abdominal conditions that constipation results.

Cannon has observed that strong emotion caused by fear, distress or rage totally inhibited all the intestinal movements.

Circulatory disturbances in the liver have a pronounced effect upon the portal circulation and both gastric and intestinal digestion. Impeded hepatic circulation causes passive congestion of the radicles of the portal veins, in consequence of which there is produced a slight hyperplasia of the epithelium, and by a functional alteration in the glands of the stomach and the crypts of Lieberkuhn in the small intestine, a hyper-secretion and an exaggerated production of mucus. Abnormal gastroenteric fermentations result, various products as gases are developed, bacteriologic processes are promoted by the changed conditions, and a true gastrointestinal catarrh ensues.

At the same time a venous stasis occurs in the pancreas and in consequence thereof a diminution in its secretion—a disturbance having an important sequence in the digestion of proteids, fats, and carbohydrates.

With regard to the relation of the pancreas to digestion it should be stated that although the pancreas undoubtedly possesses a nervous mechanism which is capable of regulating its secretion both in the direction of excitation and in that of inhibition, yet variations in the rate of secretion and in its richness as well, are probably in part under the reflex control of the nervous system. It is probable that the afferent channels are connected up to the medulla from the mucous membrane of the stomach and duodenum; at any rate it is an experimental fact that chemical or electrical stimulation of these surfaces causes a flow of pancreatic juice. The chief afferent nerve affecting the pancreatic secretion is the vagus.

The diagnosis of reflex disturbances in the digestive tract will be possible as a rule only after a thorough examination and by the process of exclusion. In this way there will be discovered conditions remote from the site of predominant symptoms, which will be found causing the reflex phenomena. This method is somewhat analogous to the explanation of exceptions in grammar and rhetoric. The general rule is apparently violated, but, on closer investigation a subtle connection will be found to exist.

In practice treatment should be confined to pathologic conditions relying upon their correction for the cure of remotely associated symptoms and the demonstration of their reflex connection.

Detroit, Michigan, 612 Washington Arcade.

TUBERCULOSIS CUTIS—LUPUS VULGARIS.[*]

JAMES F. BREAKEY, M. D.
ASSISTANT IN DERMATOLOGY IN THE UNIVERSITY OF MICHIGAN.

THE case is that of a woman, aged twenty-eight years; married five years; family history negative. She has three healthy children aged respectively four years, two years, and ten months.

Patient had pneumonia nine years ago. Four years ago she contracted pulmonary tuberculosis, which confined her to her bed from February to June, 1903. In February, 1904, she had an attack of facial erysipelas lasting eight weeks. She recovered from this but it left an unusual redness of the face. In the next July a small sore appeared on the left upper lip. This was followed by similar sores higher on the left cheek. These gradually extended to the nose, and by the following December (1904) the opposite cheek, and finally the lower lip, chin and eyelids were involved.

It is of interest to mention that a small piece of bone was ejected from the inside of the nose some five years ago. At the time this was attributed to catarrhal trouble.

When the patient was admitted to the University Hospital about two months ago the face was covered with thick crusts involving large ulcerating areas and retaining much pus, smears of which showed large numbers of tubercle bacilli, an unusual circumstance in lupus vulgaris. She was referred to the medical clinic for examination of the lungs and a report was returned showing evidence of old lesions in apices of both lungs, but no active disease was indicated.

Tonics and reconstructives were prescribed. The lesions were cleaned, crusts removed, and general surgical cleanliness attempted as far as the case permitted. Following this she was subjected to *x*-ray treatment, which has been continued to the present time with a very apparent general improvement in the condition of her face.

A consideration of this case offers little peculiar to the individual patient. It must be largely a consideration of tuberculosis cutis in general.

As to Diagnosis.—The general typical appearance at first glance could leave little doubt as to the true diagnosis. The history of a preceding pulmonary tuberculosis gives the clue to the probable source of infection, and the finding of the specific germ assures an absolute diagnosis of tubercular disease of the skin. In a less typical case the history, as given of catarrhal trouble, with the loss of bone from the nose, might quite properly excite suspicion of a possible syphilitic infection. In fact, it is quite possible that the two diseases, syphilis and lupus vulgaris, might coexist. However, we have absolutely no other evidence of a possible syphilis, while the fact that the patient within five years gave birth to three healthy children should free her from suspicion of specific taint. The only question presenting itself in the case would be a classification of the form of tubercular skin disease. Of these, there are several, varying with different authors, as, miliary tuberculosis of the skin, a form found almost entirely among patients already suffering from other forms of tuberculosis and probably the result of autoinoculation. The development is more rapid and the number of tubercle bacilli are more numerous than in lupus vulgaris. In tuberculosis cutis the small tubercular follicles may break down, coalesce and form a secondary lupus.

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[*] Read before the CLINICAL SOCIETY OF THE UNIVERSITY OF MICHIGAN, December 3, 1906.

While there are numerous other forms of cutaneous tubercular disease recognized, we need nothing further in this case. It presents a typical form of tuberculosis cutis—of autoinoculation—rapid in development and rich in bacilli, a case of primary miliary tuberculosis of the skin with coalescence of lesions and a secondary lupus vulgaris.

As to the Etiology of Tuberculosis of the Skin.—It is due in all cases to some form of infection, inoculation or extension, while of course a predisposition may exist in those generally debilitated, or in those suffering from or recovering from other forms of skin disease, as in this case, infection evidently followed close on the attack of facial erysipelas.

The pathology of cutaneous tuberculosis is similar to other forms of tuberculosis. The primary changes are all in the dermis, epidermal changes all being secondary (Hyde). "The tubercular nodule in the skin resembles that found in other organs and consists of one or more giant cells immediately surrounded by a number of small round cells which have vesicular nuclei and which are either mononuclear leukocytes or daughter plasma cells. No vessels exist in the nodule and the fibrous elements are absent or attenuated—cheesy degeneration is more often found in the miliary form."

The *treatment* is of course prophylactic and curative and the latter is general or local.

As to the Prophylaxis of Lupus.—It is to a large extent included in the prophylaxis of tuberculosis in general and in the hygiene of the skin. Patients suffering from pulmonary tuberculosis should be warned of the dangers of autoinoculation and should have mild nonirritating antiseptic solutions for washing.

As to the General Treatment of Cutaneous Tuberculosis.—It is purely symptomatic. Outdoor life, tonics, et cetera, should be prescribed and carried out quite the same as in general tuberculosis. Locally the most satisfactory in all cases is complete surgical removal of the lesions, providing they are few in number, small, and permit of closure without bad scarring. Next to excision in small lesions, and first in all forms of diffuse lupus, is treatment by means of the Finsen apparatus, and next to this and nearly as satisfactory is treatment by the *x*-ray.

Regardless of the form of local treatment determined upon and the faith one may have in it, surgical cleanliness must be observed. Crusts must be removed, pus pockets drained, and the surface kept clean, even at the expense of slight injuries to granulations and borders. Surgical dressings, gauze, cotton-bandages, et cetera, would in all cases better be dispensed with if possible. Free access of light and air to the site of the lesions should be allowed. Not only should the site of the lesions be kept clear of crusts for general reasons, but their presence seriously interferes with proper treatment. Even deep pigmentation may materially modify the results of the Finsen treatment, while crusts interfere with any form of light treatment.

The Finsen light is particularly applicable to the small single lesions of fibrous variety. The penetration must be deep and the exposure prolonged to about an hour.

Properly administered the *x*-rays are quite as satisfactory and more rapid in their results. There is quite an advantage, too, in being able to treat much larger surfaces at one exposure, though one runs greater risk of burns. The treatment with either form of light must be pushed so as to get a marked reaction, while the intervals between exposures must be long enough for its subsidence.

Koch advised the treatment of tuberculosis by tuberculin—or, as then called, Koch's lymph—some fifteen years ago. Recently more investigation has been done along this line, as is evidenced by the recent work on opsonins. Many of the cases reported as being benefited by the use of vaccines are cutaneous diseases, and of a class usually benefited by light treatment. Wright and Douglas concluded that the benefits derived from the vaccines were due to their action on the blood serum, increasing its opsonic index. All serum, of course, is opsonic within certain limits.

Clinically the light treatment has been demonstrated most incontrovertibly to be curative in its effects on many of these skin diseases and upon lupus in particular. Laboratory experiments have shown most conclusively that *x*-rays are not bactericidal, or at least but slightly so. The rays cannot act as a vaccine, modifying in any way the opsonic power of the serum. But we do know that the effect of treatment is to produce a hyperemia, and this mechanically gives us an increased proportional amount of serum together with an increased number of phagocytes. What other effects the rays have is not known. If this be all, the natural inference is that any treatment inducing local hyperemia of the parts would be quite as efficacious. Bier's treatment by induced hyperemia is a good example.

The empirical treatment by tuberculin as practiced for some years showed many successes and some failures, varying in degree from slight changes in existing pathological conditions to marked intensification or an apparent dissemination of the disease. The dose given varied from one five-hundredth of a milligram to twenty milligrams, attempting to avoid marked constitutional reaction or at least delaying each successive dose until after the subsidence of all reaction. This is in accord with Wright's negative and positive phases.

Ann Arbor, Michigan, 211 Huron Street East.

THE BACTERIAL SUSPENSION IN THE DETERMINATION OF THE OPSONIC INDEX.

RALPH E. WALKER.

CAPTAIN, UNITED STATES MARINE CORPS, RETIRED.

[FROM THE INTERNAL MEDICINE RESEARCH LABORATORY OF THE UNIVERSITY OF MICHIGAN.—DOCTOR GEORGE DOCK.]

In the determination of the true relative opsonic values of two sera, for staphylococcus, I have found it necessary to employ some modification of the usual technique, where bacteria of the ordinary degree of virulence are used.

The quantity of opsonin for staphylococcus in normal serum is so great, that when the usual method of mixing equal proportions of bacterial suspension, washed leucocytes and serum is used, the phagocytic index is so high that counting is practicallly impossible.

The usual procedure of reducing the phagocytic index, by the use of a sufficiently thin bacterial suspension, does not and cannot give true results. Enough bacteria must be introduced to exhaust the opsonin in each of the sera used. Any quantity less than this gives rise to an error which corresponds to the portion of the opsonin in the stronger serum which has not been occupied by bacteria; or, if too few germs are present to attach all the opsonin of even the weaker serum, the phagocytosis in both will be the same, and the opsonic index unity.

It has, therefore, been my practice to employ some method by which the serum is diluted more than the three times of the ordinary technique. The simplest and most satisfactory way is to dilute the sera directly fifteen to twenty-five times in one of the pipettes described by Wright for making high dilutions at a single step. It is unimportant that the exact dilution be known, but it is essential that both sera be equally diluted, as may be accomplished by using the same pipette for both.

The diluted sera are then mixed in the usual way with equal proportions of washed leucocytes and bacterial suspension.

The bacterial suspension, even with such a dilution of the serum just described, must be thick. Excess of bacteria above what is absolutely necessary does no harm. Each serum can produce a maximum phagocytosis, and when enough bacteria for this are used, double or any number of times that amount of bacteria will not increase this maximum.

That the method just described will give accurate indices, and that too thin suspensions of bacteria always cause error, can very readily be demonstrated by working with sera of known relative values, and bacterial suspensions of various densities.

The principle of a sufficiently thick bacterial suspension applied to all kinds of bacteria; but where those for which very little opsonin is present are used, even a relatively thin suspension may be sufficient. For example, almost any density of typhoid bacillus suspension will give true results because the normal typhoid opsonin is present in relatively very small amounts.

Ann Arbor, Michigan.

TRANSACTIONS.

CLINICAL SOCIETY OF THE UNIVERSITY OF MICHIGAN.

STATED MEETING, JANUARY 2, 1907.

THE PRESIDENT, HUGO A. FREUND, M. D., IN THE CHAIR.
REPORTED BY DAVID M. KANE, M. D., SECRETARY.

REPORTS OF CASES.

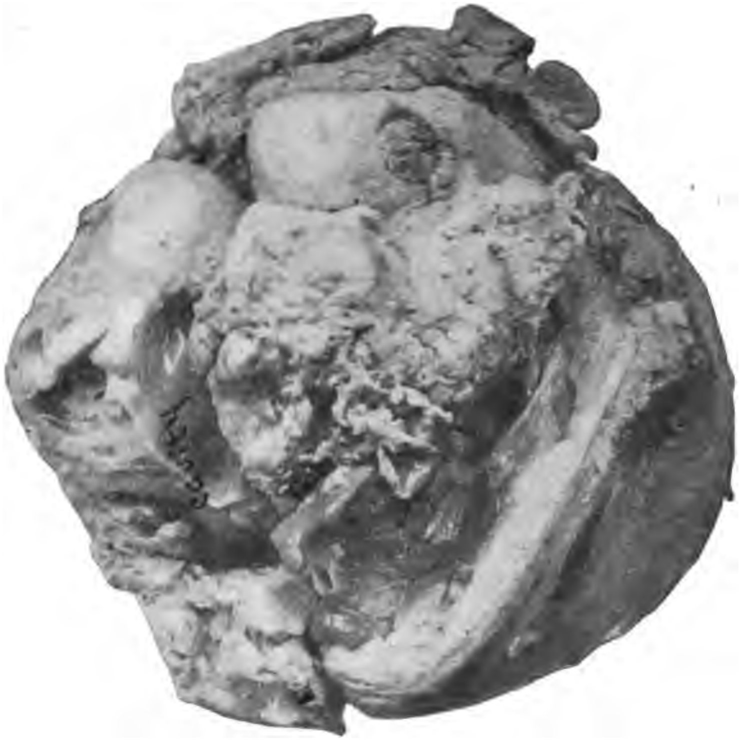
A CASE OF SO-CALLED ADENOSARCOMA OF MAMMARY GLAND.

DOCTOR FRANK A. MCJUNKIN: I want to call your attention to this case as an illustration of the importance of a knowledge of tumor structure in the diagnosis of new growths of the mammary gland. The patient exhibits the well-nourished appearance which, as a rule, is presented by those affected by this sort of tumor and by sarcoma. These tumors and the sarcomata occur most frequently in well-nourished women and, taking as a criterion some fourteen cases which have been operated upon in the surgical clinic since 1900, between the ages of thirty-five and fifty.

Miss P., age forty-six, dressmaker by trade, was admitted to the surgical clinic November 23, 1906, for treatment of a tumor of the right breast. The family history is of no importance. She had the usual children's diseases, including scarlet fever, with good recoveries and no sequelæ. In 1903 she had la grippe, and since that time has had epiphora of the right eye. This same year she was operated upon for ovarian fibroid, the right ovary and part of the left being removed. Up to this time periods were regular, but have been irregular since then.

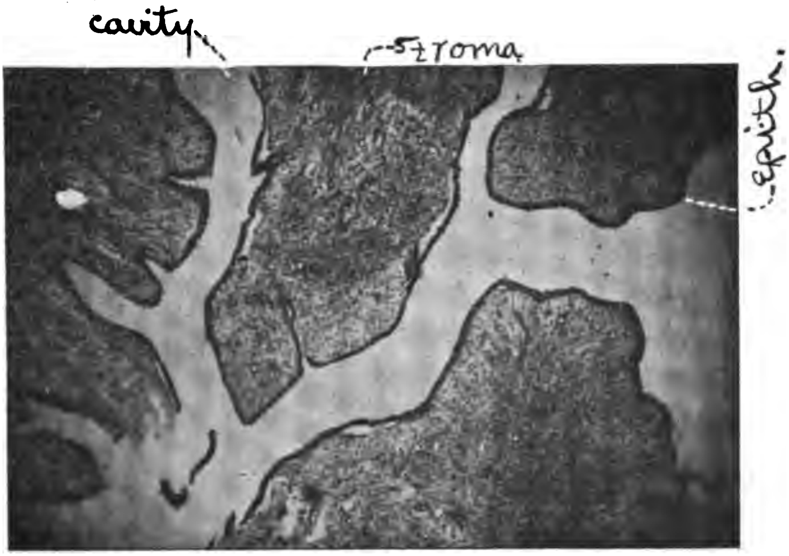
In 1900 she noticed that the right breast was hard in consistency and somewhat larger than the left. It grew gradually but slowly up to July, 1906. Since this time it has grown much more rapidly. During the last three years her general health has been good and she has acquired flesh.

On examination there is found in the right breast a growth the size of patient's two fists. It underlies the nipple, which is depressed below the surface but not retracted. It is fairly movable and apparently encapsulated. In the lower and outer quadrant there is a solid mass the size of a goose-egg, while the remainder of the tumor feels cystic, which was commented upon by every one who examined it. The axillary glands were not palpable. The physical examination of chest and abdomen were negative. The blood showed, hemoglobin 80%, whites 8,700, and reds 4,700,000. Urine was negative.



You now have, I think, all the data of importance, and we arrive at the question of diagnosis. That the question of diagnosis in these cases is a difficult one is evidenced by the fact that in this case three distinct opinions were ventured. They all differed, and not in minor details only, for there existed the greatest possible separation. The operation indicated by one diagnosis was simply excision of the tumor mass, by the second wide removal of surrounding structures, and by the third all this and a clearing out of all the glands possibly infected. The prognosis varied according to these diagnoses between fifteen per cent chance to survive three years or more and absolute certainty of a cure. This confusion I think you will own must lead either to grave mistakes or to unnecessary mutilation.

Now we will approach the subject from a pathological standpoint. This tumor, as you can make out by examining the photograph of the gross specimen, and the microphotograph answers in every detail the description of the adenosarcoma given in leading American text-books of surgery, and I am informed on excellent authority that this is the sort of tumor called by untrained pathologists adenosarcoma. Ziegler mentions adenosarcoma only in connection with the tumors of the kidney, classified as teratomata. Although I have investigated only the more recent literature, I think the statement is true, that there has been no report of a case of adenosarcoma of the breast accompanied by data sufficient to warrant the diagnosis of sarcoma. These tumors do not infiltrate, nor do they cause metastases or cachexia. They lack not only these characteristics of a malignant growth, but they do not fall among the sarcomata according to the ordinary definition of this tumor, which is, "a sarcoma is a connective tissue tumor in which the cells, because of their number or size, predominate over the intercellular substance when compared with the tissue from which they arise," for it is a well-known histological fact that the periductal connective tissue is very cellular. If we can conclude then that these tumors very rarely if ever become malignant, we can go a step farther. As a result of the



mode of growth of cystadenofibroma, the cyst cavity is necessarily a comparatively large one because every papilliferous ingrowth increases the size of the cavity. If a large cystic cavity can be made out, as was the case here, degeneration cyst is impossible, and if solid masses can be made out, thus ruling out cystadenoma, we can diagnose the tumor as benign.

VON RECKLINGHAUSEN'S DISEASE.

DOCTOR HUGO A. FREUND: In 1882 von Recklinghausen described for the first time the histological structure of neuromata. He maintained Virchow's anatomical classification, namely, dividing them into the true and false growths, but in addition he showed that fibroma nolluscum and the fibroneuromata had a very closely allied structure. In 1900 Alexis Thomson, of Edinburg, wrote a book in which he thoroughly reviewed all the work that had been done on neuromata and gave a logical classification of the various forms of nerve tumors.

The case that I am to present to you tonight has many interesting features. It comes under the type of false neuroma in that it contains no true nerve elements, namely, ganglion cells. It has on the other hand nerve bundles running through it, as can be seen by examining the section of one of these tumors. The remainder of the tumor is composed of fibrous tissue which is a proliferation of the epi- or perineurium, and composes the nodule. These tumors may be solitary or multiple; they may be situated in the skin or they may be subcutaneous. The most common type is the latter (multiple and subcutaneous) situated along the nerve trunks in all parts of the body, and giving rise to masses from minute nodules up to the size of an orange. At times we come across a form in which many such nodules form a nest of tumor having a net-like arrangement. This form was originally described by Bruns in 1870 as "Rankenneurom," and corresponds to what we now call plexiform neuroma.

The patient before you is twenty-two years old. She has a good family history, there being no other cases of the kind in any of her kin, nor any member suffering from any nervous disorders or mental disease. She was in good health up to the age of fourteen, when she had a severe fever. She was confined to her bed for three months, and it was here that she noticed for the first time that a small swelling, hard and about the size of a pea, had appeared in the right groin. She paid no attention to the swelling and it gave her no trouble. At sixteen she began to menstruate and was regular. Soon after, however, she began to have pains in her legs on retiring at night. These became so severe that she could not lie in bed nor sleep. Soon new nodules made their appearance so that she could feel them on straightening out her legs both at the bend of her knee and along the course of the nerves of her thigh. The pain became so intense about this time that she sought the advice of a physician. Examining her pelvis, he found that she had a slight retroversion, and sought to relieve her of all her pains by restoring the uterus to its normal position. So at the age of seventeen, one year after she began to menstruate, the patient consented to undergo the operation at the hands of this *surgeon*. About six days after the operation she noticed a slight spasm of all her muscles followed by an intense "drawing" of her arms and legs. From this time on these spasms became slowly and gradually more severe and more intense, and her ability to use her muscles at the same time lessened. So that at the present time you see her in this contractured position, with atrophy of her forearm muscles and an extensor atrophy in the remainder of the muscles of her extremities. Her reflexes are increased and she has disturbances of heat and cold, analgesia, hyperalgesia and anesthesia in various parts of her body. At present the nodules involve nearly every nerve of her body and are readily palpable. The largest is about the size of a plum. On the outside of the right thigh there is a swelling about the size of an egg, soft, in which numerous small masses can be felt, suggesting the plexiform type. The upper part of her thorax shows several blotches of pigmentation of a pale brown color, such as are frequently seen in these cases. There are none on the face or extremities. Mentally these cases present peculiarities that have an unusual relation to other diseases involving degenerative processes. The disease is often found in imbeciles or in individuals having some retrograde change, especially of the central nervous system. This is apparent at times only through slight defects of some of the special senses. In this patient we find a difficulty in articulation. In addition, there are times when she cannot express herself as she wishes. This she has noticed herself, and is frequently observed in similar cases. Aside from her paralyses and sensory disturbances the nodules are painful to the touch. Especially do those in the lower part of her back give her pain, due to lying on them. She has no bladder or rectal difficulties. Her blood shows a slight secondary anemia, and her urine is normal.

A CASE OF OSTEOMYELITIS IN WHICH EPITHELIAL SOWING WAS EMPLOYED.

DR. LE ROY W. CHILDS: The case I wish to present to you this evening entered the surgical clinic October 1, 1906, with the following history: Three years ago, patient ran a drag tooth into the lower right leg. The wound healed soon after, and the leg was apparently normal until September 1, 1906, when it rather suddenly became tender, painful and swollen. The condition of the right leg grew steadily worse, and the patient entered the hospital with a high temperature and pulse rate. He was operated upon the second day after entering, and very extensive necrosis of the right tibia was found, necessitating removal of nearly the entire anterior one-half of the bone. The wound was subsequently treated by the open-air method, combined with boric acid dusting, which latter much facilitated the formation of granulations, but which had to be discontinued on account of the patient developing symptoms of boric acid poisoning.

The wound has progressed very favorably in healing processes, except that the ingrowth of epithelium from the wound edges has been slow, as is always the rule in this variety of cases. With the hope of hastening the epidermitization of this wound, two operations of epithelial sowing have been performed as follows: A small area of normal skin is made surgically clean, and by means of repeated rapid strokes with a sharp knife held at a small angle to the skin surface, the epithelium is removed in successive layers, until blood serum and blood begin to exude upon the wounded surface. At this point a clean knife is used, and some of the scrapings below this level are removed and placed upon a freshly denuded granulating area and carefully spread over the dry surface, the bleeding caused by removing the upper layers of the granulation having been controlled by pressure. The desired area having been covered by this so-called epithelial pap, the area is covered with strips of rubber tissue and allowed to remain several days without being disturbed. The new epithelium is formed by some cells from the lower layers of the epidermis remaining viable and engrafting themselves upon the denuded surface of the granulations, and by their subsequent proliferation forming the various layers of the corium and dermis.

Great care must be exercised against the masceration of this epithelial pap by wound secretions, the first operation upon this patient nearly resulting in failure from this cause alone. The second operation resulted in the formation of two islands of new-formed epithelium, which rapidly merged into one another, and as they grew in size they united with the skin border of the wound, which was about one-quarter of an inch distant. A seemingly chemotactic action exists between the approaching edges of epidermis, as is claimed to be the case by Doctor Noeske, of Dresden. The advantages of this method of skin-grafting are the simplicity with which it can be performed, and the large area of denuded surface that may be covered by a comparatively small area of normal skin.

TRAUMATA OF THE ORBIT.

Doctor Gordon Berry: N. E., male, age forty-two years, harness-maker, entered the hospital with rebellious inflammation of right eye of over a year's standing.

The previous history has little bearing on the case except that one and a half years ago the patient had an attack of gonorrhea and still has "urethral trouble." This fact might lead to an erroneous suspicion as to the cause of the present condition.

The present trouble began at the same time, one and a half years ago, the patient says, as an itching at the outer angles of both eyes. The left eye improved rapidly and has given little trouble since. The right remained reddened and was occasionally painful. There was but little discharge, more on awakening in the morning, when the lids were frequently stuck together. A constant sensation of sand in the eye was described. The condition had proved rebellious to all treatment.

On examination the vision is found to be $\frac{15}{15}$ in the left eye and $\frac{15}{50}$ in the right, the involved eye. Oblique illumination revealed a small corneal ulcer at about 8 o'clock of the cornea, near the circumference; and the whole upper half of the cornea was hazy. On the lower lid near the outer canthus (O. D.) were found three or four ingrowing ciliæ, the cause of the present trouble, and one readily overlooked. These were removed, and the ulcer touched with iodine on three successive days. On January 6, the ulcer was found to be healed over and only the scar left. This will take some time to be absorbed. The patient was discharged on January 7, 1907.

* * *

A. H., male, twenty-two years of age, farmer, entered the hospital November 31, 1906. The patient gives the following history:

At noon on November 30, 1906, while hunting, he was struck in right eye by birdshot from a shotgun, fired at a distance of about a rod, and at patient's right. There was at the time considerable pain in the eye, which lessened, but continued until the patient reached this hospital the next morning.

Examination revealed two abrasions (caused by the shot in passing the fold in the lid) and one wound, in the right upper lid. The bulbar conjunctiva was perforated a little above the cornea and slightly temporally, or toward 11 o'clock. There was considerable chemosis. Oblique illumination of the eye showed the posterior chamber to contain much clotted blood. The vision was nil.

The eye was cleansed, ice-compresses were applied for about fourteen hours and again the next day for five hours, and atropin and argyrol were instilled twice daily.

The radiograph reveals a shot lodged a little to the right of the median line, back of the orbit and below the floor, apparently imbedded in the ethmoid or sphenoid bone.

Yielding to treatment the swelling gradually subsided; no infection took place, and the condition steadily improved. The patient was discharged on December 17, 1906. At this time the posterior chamber was still partially filled with blood clots, the lens (as nearly as could be then determined) was luxated, the superior attachments having been freed and the lens fallen backwards and slightly inwards. Only a slight amount of vision had returned.

Whether the ball in passing to its final lodgement had gone through into the posterior chamber and then on out again, or whether it passed around the eye, not perforating all of its coats, must remain, at least for the present, a matter of conjecture. At all events, it ruptured by contact or concussion, the ciliary blood-vessels, and injured the superior attachments of the lens. The condition was not considered to be such as to indicate an attempted removal of the foreign body.

* * *

J. G., male, age twenty-nine years, American, farmer, of Bronson, Michigan, entered the hospital January 2, 1907.

On January 1, 1907, at 3 P. M., patient was driving a 20-penny nail, when latter flew and struck him in the left eye, as it passed by. The nail was a new and therefore a clean one. The sight was at once lost. The eye bled profusely for a while. The attending physician cleaned the part with boric acid, applied cold compresses, and brought him to the hospital as soon as he could, arriving here about twenty-four hours after the accident.

The vision on entering was: O. D.—15/30, and O. S. only moving objects. On examination of the left eye, the upper lid was found to be slightly swollen. The conjunctiva was somewhat inflamed and showed marked chemosis. A penetrating wound was found about three-eights of an inch long, running along the lower margin of the cornea, in the conjunctiva. The iris was slightly pale, slightly bulging, and the lower third was gone, protruding as a flap through the wound. The anterior chamber contained a little clotted blood. Considerable blood could be seen in the posterior chamber, particularly toward the nasal side.

The wound was cleaned and the protruding iris cut away. The patient was put to bed. Argyrol, twenty-five per cent, and atropin were instilled twice daily, and cold compresses applied. These last were continued for six hours on that day, and again, intermittently, for twelve hours on the following day. Two days after entrance the chemosis was much reduced, and the wound closed. That night the wound was forced open again by the patient's tossing during his sleep, and a slight amount of blood was found on the dressings the next morning. This, however, closed during the day, and the condition has since been steadily improving. No infection took place. On January 10, the patient got up. Examination in the dark room showed the blood clot in the posterior chamber to be much diminished. As near as could be determined the lens was in position and undamaged. The fundus reflex could not be obtained, but the vision was improved, the patient being now able to count fingers, though with difficulty. On January 15, the clot was found to be lessened and movable in the posterior chamber. The ophthalmoscope showed the fundus reflex to be present but the details of the retina could not be made out. V = 7/200.

* * *

P. P., male, American, farmer, of Lisbon, Michigan, entered the hospital on November 26, 1906. Patient went hunting. In the act of climbing over a fence, his gun discharged, the shot striking patient on the right side of face. The shot were size number six. Several entered the orbit and the sight was at once destroyed. Immediately following the accident a sympathetic inflammation was set up in the other eye, evidencing itself as a marked photophobia. After two weeks this subsided.

He came to the hospital, to learn what could be done for the condition. The vision on entering was O. D.—nil. O. S.—15/30. Tension in O. D. nil. The right eye was closed and the upper lid showed a jagged scar in the center where a shot had penetrated. The eyeball was sunken, showing evidences of laceration from the entering shot. Just under the supraorbital arch were palpated two shot. There was considerable discharge from the lids. This was treated twice daily with argyrol, twenty-five per cent, and on January 13 the eye was prepared for operation.

The radiograph taken showed one shot in the eyeball itself, and as nearly as could be determined, three in the orbit, several under the skin over the forehead, two in the nose, one in the right cheek, and two in the chin.

On January 14, the right eye was removed under a general anesthetic. It was found to be bound down by many adhesions. These were cut and the eye enucleated. One shot came away with the eyeball, being lodged in the sclera. Palpation in the cavity revealed two more in the fatty tissue of the orbit. These it was considered inadvisable to remove.

WILLS HOSPITAL OPHTHALMIC SOCIETY.

PHILADELPHIA.

STATED MEETING, OCTOBER 22, 1906.

THE CHAIRMAN, S. LEWIS ZIEGLER, M. D., PRESIDING.

REPORTS OF CASES.

Doctor Frank Fisher reported a case of bullous keratitis in which, after having tried various forms of treatment, he believed that it would be best to perform an iridectomy, although his experience in the past was against the procedure. Doctor Charles A. Oliver favored the operation, basing his feelings in regard to the procedure upon the good results which had been obtained by him in somewhat similar conditions. Doctor Ziegler thought that attention to the tear passages with a subsequent iridectomy would be the best line of therapy. Doctor Harold G. Goldberg stated that in his hands dionine in five per cent strength solution had been of value in some cases which had come under his observation. Doctor Oliver said that this had also been his experience.

Doctor Fisher experienced an interesting case of traumatism from a fragment of tool or coal which had been inflicted two weeks previously. The foreign mass had torn through the lower outer corneal edge and ciliary region of the right eye. There was a localized opacity of the crystalline lens and adjacent capsule in the wounded area. Intraocular tension was normal. The case being a new one in the hospital, it was the consensus of opinion of those present that the *x*-ray should be immediately used and attempts made, if possible, to remove the foreign mass, do an iridectomy, and remove the lens; the case to be reported upon at the next stated meeting.

Doctor Oliver exhibited a curious type of traumatism in which the corneoscleral limbus and the underlying iris had sustained a clean-cut incision from a large piece of steel that had not penetrated any farther into the eyeball. The two flaps of the wound were situated upon different planes and levels. The anterior chamber was closed. There was no reaction. The wound healed. Radiographs failed to show the presence of any foreign body in or around the eye, and the patient recovered with the restoration of the parts to their normal position with a scar which was only visible by strong concentration of light and high magnification. There was full vision and large uninterrupted fields. Treatment had been limited to the use of iced compresses, atropin, and rest in bed.

Doctor Oliver showed a case which he had seen two hours after an accident, and in which a drop of eserine had been instilled, carrying a small iris prolapse back into its normal position, and giving a round pupil without any appearance of traumatism other than a small slightly concentric vertical cut through the cornea. The following day, the patient reported with a localized iritis, a spongy deposit upon the anterior capsule of the lens, and a deep mass of lymph in the bottom of the anterior chamber. Vision was reduced from practically normal to light perception. The patient was immediately admitted to the hospital and placed in bed. Hot compresses were employed, and changeable iridoplegics and cycloplegics were used. All of the signs of inflammation subsided, and the patient one week after he had been injured, recovered with full acuity of vision, two small posterior synechia in the position of the previously bruised iris alone remaining. He brought the case before the society to illustrate a principle which he and Doctor Fisher had established in their hospital services a number of years ago —to immediately excise all prolapses of the iris tissue, no matter how small or recent they might be. Doctor Fisher agreed with Doctor Oliver in reference to the advisability of such a procedure, and had made it an unalterable rule to do this in all cases of this kind since the time mentioned.

Doctor Ziegler spoke of a case with the history that a piece of steel had been driven into the eye several years previously, cataract developing. The patient had been in the hands of a practitioner who had failed to make use of *x*-ray study. The moment that Doctor Ziegler saw the case, he ordered radiographs to be made, with the result that a foreign body within the eyeball was recognized. The mass was immediately removed, the cataract extracted, and vision with glasses was brought to almost normal, thus proving the direct advantage of *x*-ray study in every suspicious case.

DOCTOR McCLUNEY RADCLIFFE made mention of a case in which two sets of negative studies with the *x*-ray had been made in spite of the fact that he felt sure clinically that a foreign body was within the eyeball. A third series of plates gave an undoubted shadow with its localization. Immediate operation was resorted to, and a foreign body was successfully removed, leaving an useful and unirritated eye. The foreign body was two millimeters square in size. He also spoke of some rare types of traumatic cataract in which there was not any apparent external wound. In two cases he had seen, the character of traumatism was extremely slight, one being the result of the shaking of a piece of light dress goods in which a closed eyelid was struck, and in which a resultant cataract was more probably caused by capsular breakage.

DOCTOR OLIVER gave a brief account of a case that he had seen two weeks previously, in which the findings of a carefully made *x*-ray study coincided exactly with those from a series of examinations of the visual field; it being his rule, whenever possible, to have the field of vision gone carefully over by a competent assistant. In this instance, a peripherally situated scotomatous area of positive type, sharply cut in outline, made him feel that either a small sector of the optic nerve had been injured or the adjacent retina had been seriously wounded. The foreign mass, a piece of steel some fourteen millimeters in length, most accurately located by Doctor William W. Sweet, showed that its posterior extremity was protruding through the posterior portion of the eyeball some two millimeters to the temporal side of the globe and that it had cut the optic nerve in actual relationship with the lost portion of the field. An incision in the proper place being made, the foreign body was withdrawn upon the first essay of the magnet.

An informal discussion upon the use of iced compresses in cases of traumatism, both accidental and purposive, gave some interesting facts in regard to the first establishment of this form of practice in the hospital. Doctors Fisher, Oliver, and Ziegler related some details as to their difficulty in overcoming the many objections offered to the plan that they had encountered during the introduction of a method which is now so universally employed in the hospital, and which has met with so much success.

DOCTOR GOLDBERG gave a very carefully detailed account of a number of bacteriologic experiments which he had conducted with several different makes of cosmoline. As one of the results, he had found among a great number of experiments, that certain kinds of cosmoline seemed germ free. His work, pursued with alkaline, acid, and neutral materials, gave findings which induced him to cover eyeballs that had been opened by traumatism with large masses of the germ-free variety of drug. As a result, it is in his belief, that these types of material are of value in the treatment of open eye wounds, protecting them from the entrance of extraneous and harmful bacteria. He has now advanced sufficiently in the work as to make clinical studies, some of which are in active progress. Thus far he has found that healing is more perfect and much more prompt with the use of the material than it is with other methods. In a number of his cases he had noticed that the patient had experienced the taste of the drug. Doctor Ziegler made mention of the fact that he had seen the drug employed empirically by others, and that he remembered that Doctor William F. Norris formerly used it to advantage in the hospital. Doctor Oliver substantiated Doctor Ziegler's second statement, as he had often seen Doctor Norris successfully employ the then so-called refined makes of the material in many serious cases.

Doctor Ziegler gave a brief history of a case of melanosarcoma about as large as a small bean situated at the corneoscleral junction of the left eye of a middle-aged man in whom six months previously, the growth appeared as a minute pigmented plaque. When the case was first seen, the patient had been advised immediate excision of the growth. At present the mass is lobulated, densely pigmented, and covers one-third of the cornea. The eyeball is involved and there is considerable injection. Just beneath the principal growth there is a small carnified nonpigmented mass which presses into the lower lid.

Doctor Goldberg showed a number of specimens of several types of sarcomata in various stages and in different positions, giving brief histories of the same.

ORIGINAL ABSTRACTS.

SURGERY.

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ADJUNCT PROFESSOR OF OPERATIVE SURGERY IN THE DETROIT COLLEGE OF MEDICINE.
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THE COMPLETE OPERATION IN ALL CASES OF APPENDICITIS.

In the *New York Medical Journal* for November 10, 1906, Ward protests against the simple opening of appendiceal abscesses, and makes a plea for the complete operation in pus cases, citing authorities to maintain his position. He recalls the general conservatism of a few years ago, and relates how White, as recently as 1899, "gave as many rules as to when to operate and when not to, that the student hated to be asked the question as to how to treat appendicitis." He refers to Richardson's changed opinions and methods and decreased mortality. "The only surgeon," he states, "who still holds to the old doctrine of delay in certain cases, and who still teaches it, is Ochsner.

The contentions made by the author are that the percentage of recoveries after complete operation is lower than after the incomplete methods, that complications such as subphrenic abscess, liver abscess, pylephlebitis, splenic abscess, septic pneumonia, et cetera, may more often be avoided, and that healing of the wound will usually take place in four weeks, where the work is thorough, whereas after simply opening an abscess and nothing further, it takes several months for healing to be thorough. He reports four of his own worst cases, and after a study of them and of the cases of others, declares that complete and thorough work can be done safely in the region of the appendix even though pus is present, and that it should be done, as it will give better results than any other method. F. B. W.

GYNECOLOGY.

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AND
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FORMERLY FIRST ASSISTANT IN GYNECOLOGY AND OBSTETRICS IN THE UNIVERSITY OF MICHIGAN.

URETHRAL BACTERIA AS A FACTOR IN THE ETIOLOGY OF CYSTITIS IN WOMEN.

Taussig (*American Journal of Obstetrics,* Volume LIV, Number IV) contributes a study of the bacteria found in the urethral canal of women, with special reference to determine the cause of certain cases of cystitis. Rovsing first suggested the bacteria of the urethra as a possible cause of cystitis, and his observations have since been confirmed by a large number of investigators. In bacteriologic examinations of the urethra made in many instances in women without disease of the urinary tract, pus cocci, colon bacilli, and other organisms were shown to be present in a great proportion of cases. Piltz found after a careful examination of ninety-seven patients that bacteria are less numerous in the urethræ of pregnant women than in those of the nonpregnant. The percentage again rises, however, when puerperal women are considered.

When considering the results obtained by various investigators their conclusions are, apparently, hopelessly contradictory. This confusion results from differences in conditions and methods, such as character of the material, preparation of the urethra, quantity of material examined, kind of media used, exactness of study of individual colonies, and conception as to what constitutes a pathogenic bacterium. The writer in his investigations adopted in its essentials the method of Piltz. The cases selected were largely gynecologic patients free from disease of the urinary tract and acute pelvic inflammation. The patient assumes the dorsal position, the labia are held apart by an assistant, the urinary meatus dried with a piece of sterile cotton, and a platinum loop passed one-half centimeter into the urethra. The material obtained in this way was inoculated upon fluid agar and poured into a Petrie dish. The agar dishes were incubated and studied at short intervals. The observations were limited to staphylococci, streptococci, and colon bacilli, these being the chief organisms found.

In all, forty-five cases were observed. Five of these were bed patients and the remainder out-clinic patients. The following table shows the results of the examination of the forty-five cases.

No. of Cases	Pathogenic Bacteria	Staphylococcus Albus	Staphylococcus Aureus	B. Coli Communis	Streptococci	Other Bacteria	Sterile
40 out-clinic patients	25(62.5%)	23(57.5%)	1 (2.5%)	2 (5%)	....	17 (42%)	7 (17.5%)
5 bed patients	4 (80%)	3 (60%)	....	1 (20%)	2 (5%)	4 (80%)	1 (20%)

To determine the part played by the catheter in introducing germs into the bladder from the urethra the author made eight tests as follows: Material was obtained in the usual way from the urethra and inoculated. A sterile catheter was then passed into the bladder and the first ten cubic centimeters of urine caught in a sterile test-tube, and then inoculated on agar plates. In six cases the bacteria obtained from both urethra and urine were identical. In two cases both urethra and urine were sterile.

In the prevention of cystitis, trauma and infection are to be avoided if possible. Catheters specially constructed to avoid trauma are not successful in operation. By introducing nonpathogenic germs into the urethra in a number of cases and using irrigations, the writer found that it was impossible to free the urethra from germs. Since the findings of Taussig would indicate that it is often impossible to conduct an aseptic catheterization he suggests that when it is necessary to catheterize oftener than once, an antiseptic irrigation, such as boric acid solution, be used after each catheterization. Urinary antiseptics such as formin, or urotropin, are also to be employed. C. G. P.

Jackson, Michigan, 249 Wildwood.

OBSTETRICS.

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AND
ROLLAND PARMETER, B. S., M. D.

APPENDICITIS AND EXTRAUTERINE PREGNANCY.

SUTTER (*Korrespondenzblatt für Schweizer Ärzte,* 1906, Number IX) describes this interesting complication. A patient suffering from severe anemia showed symptoms of ectopic gestation with rupture of the sac. Her leukocytosis was 16,000. The history was the characteristic one of extrauterine pregnancy. Examination per vaginam showed a hard, very sensitive tumor, lying somewhat high up and to the right.

The uterus was pushed to the left. The diagnosis was made of an infected hematocele from a ruptured ectopic sac. The infection came ostensibly from the appendix. During the next few days the symptoms abated. On their return with increasing vigor, due in all probability to errors in diet and the onset of a local peritonitis, surgical intervention was deemed necessary. The tip of the appendix was found adherent to the tumor mass, and was with difficulty separated and removed. The ruptured ectopic sac was not disturbed. Convalescence uneventful. On the tip of the appendix was found a white pepper-corn. The patient stated that she had formerly suffered from so-called heart-burn and had many times eaten pepper-corn. The author speaks further of the etiology, diagnosis and treatment. The history pointed conclusively to extrauterine pregnancy. Later examination disclosed the right tube to be thickened and the right ovary enlarged and adherent.

W. H. M.

PEDIATRICS.

ARTHUR DAVID HOLMES, C. M., M. D.

GONORRHEA IN LITTLE GIRLS.

Trenwith (*New York Medical Journal,* February 3, 1906) presents twelve cases with definite results of gonorrhea in little girls. He says the majority of cases in little girls occur in families of the poorer classes, where of necessity the sleeping quarters are crowded and bathing facilities poor. The following treatment was adopted in most cases: One to four thousand permanganate of potash as a douche three times a day by means of a fountain syringe, and a number 13 French soft rubber catheter, and as the case improved and the discharge became slight douches of zinc sulphate and alum, a drachm to the pint, were given morning and evening, and on occasions of their visits to the clinic by injections into the vagina of a solution of nitrate of silver varying in strength from one to two thousand to one to one hundred and twenty-five. The cure was then complete.

He emphasizes the following points: (1) The great need for early diagnosis and treatment. (2) The necessity for frequent douching with large quantities of the solution. (3) The nonuse of absorbent cotton as a dressing for the parts. (4) The need for care and gentleness in the treatment. (5) That a case should not be considered as cured until not only the discharge has stopped, but until it is no longer possible to find the gonococcus in the vaginal secretions microscopically. (6) The need of impressing the mother with the serious nature of the disease and the necessity for treatment until the gonococci have entirely disappeared. (7) The greater dissemination of knowledge among men and women who suffer from gonorrhea, as of its infectiousness to others, and its power to do, at times, great harm, at a period remote from the time of primary infection when the disease remains uncured. (8) The great necessity for care in keeping cases of gonococcus vaginitis out of day nurseries and babies' hospitals, because of the epidemic character which it assumes among the inmates when once it has gained a foothold.

LARYNGOLOGY.

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PRACTICAL PROBLEMS IN OTOLOGY AND RHINOLOGY.

In an address on this subject given before the American Academy of Ophthalmology and Otorhinology, Doctor Dundas Grant, of London, gives some practical points (*The Journal of Laryngology, Rhinology and Otology,* September, 1906). Besides the discussion of a number of otologic questions, he takes up problems that are of interest to the laryngologist. He considers the value of inspiration and suction in nasal and laryngeal therapeutics, and draws attention to a point in physiology that is of importance to the laryngologist. It is that during vigorous inspiration the expansion of the chest must mechanically induce a certain amount of dilatation of the heart and great vessels. This leads to a diminution of the blood pressure in the peripheral vessels, including the vessels of the upper respiratory tract. The direction of suction favors the formation of coagulation plugs in vessels which may have been opened, as by operations in the nose. The hemorrhage following adenoid operations may be lessened by having the patient vigorously snuff up through the nose and spit out the blood which may have been drawn out into the back of the throat. The application of the inspiratory effort may be taken advantage of in emptying of the accessory sinuses. The patient should pinch the nostrils and then draw a full breath, thus exercising suction more or less on all the sinuses, but, as a rule, chiefly on the frontal as having the most dependent opening. By changing the position of the head the various sinuses can often be emptied. This principle of suction can be taken advantage of in the irrigation of the nose.

Doctor Grant also discusses the value of intranasal treatment for spasmodic asthma. He agrees with the commonly accepted opinion that the nose is an important factor in the causation of asthma, and that a certain number can be relieved by intranasal operation.

The influence of nasal obstruction upon the middle ear is next discussed. He recognizes the important relation between nasal obstruction and nonventilation of the tympanum, also the practical difficulty of deciding whether a given operation upon the nose will improve the hearing. When air can be made to enter the tympanum by inflation, and the hearing is improved, we may regularly expect to have the deafness improved by the correction of the nasal obstruction. The author quotes Doctor Röpke, who has noticed that in the large majority of cases the hearing power was lower on the side of the nasal obstruction, and if there was deafness in both ears the worse side usually corresponded to the obstructed side. Doctor Grant describes his method of passing the catheter in the presence of nasal obstruction due to spurs. Spurs usually run upward and backward, so the catheter should be introduced with the concavity upwards, the point lying on the floor of the nose under the anterior part of the spur. It will be readily seen that the farther the point advances inwards the more vertical room there will be for it under the spur, and thus placed it will get freer instead of more jammed, as it would be if the ordinary position were adopted.

ORIGIN OF RECURRING, SPONTANEOUS ERYSIPELAS OF THE FACE.

Lavrand (*Revue Hebdomadaire de Laryngologie, D'Otologie et de Rhinologie,* September 22, 1906), at the conclusion of his article on this subject, says that in the majority of cases recurring spontaneous erysipelas of the face is an extension from the nose, either by way of the lachyrmal route, or from the nares. The point of origin is either in the nasal fossæ, or, as is more often the case, from the hypertrophied adenoid tissue in the vault of the pharynx.

The preventive and curative treatment of repeated attacks of erysipelas of the face consists in the care of the nasal cavities and the vault of the pharynx. Special importance is attached to the removal of the adenoid tissue from the vault of the pharynx. This tissue exists either in the form of tumors, or as granulations, and offers a favorable soil for the preservation and growth of the streptococcus of Fehleisen.

PROCTOLOGY.

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THE OPERATIVE TREATMENT OF CANCER OF THE RECTUM.

Doctor George B. Evans, of Dayton, Ohio, in a paper presented at the Boston session of the American Proctologic Society, gives his method of operating and reasons therefore as follows:

A proposed operation for cancer of the rectum has for its object: first, a low operative mortality; second, a high percentage of ultimate cures based upon the three-year rule; third, leaving our patient in as comfortable and presentable condition as possible.

These results depend upon early operation, complete isolation of the organ affected and removal of all lymph nodes and vessels through which growth passes.

The patient should be made fully aware of the character, gravity, and possible result of operation.

Colostomy is only a palliative procedure with little danger attached; while in extirpation with either method we have radical operation, which offers almost absolute freedom from pain, together with a more or less well grounded hope of permanent recovery.

The technique is about the same as all authors employ with this exception, namely: He transplants the levator ani muscles and neighboring fascia to the bowel after the disease has been removed and before the bowel has been stitched to the anus; and he inserts his drainage, fan-shaped, posteriorly to the bowel and in front of the coccyx. The transplantation produces a constriction and a so-called third sphincter. The drainage so placed allows a better union possible at the anus.

This technique he has followed in five cases, and in each case his patient has been able to control the bowels and keep clean and neat without the use of a napkin.

By virtue of the circular fibres of the bowel and the extensive denudation following the above technique by the transplantation of the levators and neighboring fascia, we obtain the third sphincter, so called, and thereby control the action of the bowels.

DERMATOLOGY.

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A CASE OF PEMPHIGUS LIMITED TO THE MUCOUS MEMBRANES.

Doctor Edmund M. Cocks, in the *Journal of the American Medical Association,* Volume XLVII, Number XXI, reports an interesting case of pemphigus of the mucous membranes. The patient was a married woman, aged thirty-one. The disease first appeared about one year before its fatal termination, and was intimately associated with the menstrual periods. The woman conceived, and at regular monthly intervals during her pregnancy had severe constitutional disturbances and a pronounced pemphigus eruption involving all the accessible mucous membranes. She was delivered at full term. The condition of the child is not mentioned. During the following three months she appeared better. Then there was a return of all her symptoms, vomiting, diarrhea, emaciation, and death in one week.

During the height of an attack the contents of one of the vesicles was aseptically extracted and examined, and found sterile. Examination of the contents of a vesicle several days old revealed staphylococci.

During an attack there was a leucocytosis of about ten per cent. Between attacks the blood was found normal. At autopsy vesicles were found in nares, mouth, pharynx and esophagus, on the mucous membranes of the stomach, and throughout the whole course of the intestinal canal. There were a few disseminated vesicles on the serous surfaces of the liver, spleen, intestines and pleura. J. F. B.

THERAPEUTICS.

DELOS LEONARD PARKER, PH. B., M. D.
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SOME DIETETIC ERRORS AND THEIR EFFECTS.

DOCTOR W. BLAIR STEWART, of Atlantic City (*Therapeutic Gazette,* November, 1906), discusses the question of diet in relation to both the sick and the well. He begins by stating that the indiscriminate mixing of foods is a frequent cause of gastric disturbance, and that dietetic indiscretions cause a majority of all diseases, excepting those acute or contagious in character.

Following the directions of several text-books many physicians advise their patients and others to use cereals and fruit at breakfast, with bread and butter and a light meat or eggs. As a rule this results in the persons taking grape fruit, tart oranges, or strawberries, usually covered with sugar; then oat, wheat, or malted (so-called) breakfast foods with sugar and cream; then beefsteak or chops, with hot cakes, muffins, or hot bread, and coffee. A meal of this kind is certain to be followed in from a half to one hour by an attack of fermentative indigestion, with its usual train of symptoms. This is because the combining of a strong fruit acid with starch and sugar constitutes an ideal combination of fermentation. Doctor Stewart emphasizes the importance of avoiding this combination, and suggests that with starch and sugar the strong acid fruits should be supplanted by the mildly acid and sweet fruits, such as prunes, bananas, figs, and sweet apples, or, better still, by salt. In fermentative indigestion wheat cereals are to be preferred to oat cereals. In whatever form the cereal is used, it should be cooked for a number of hours, so that the starch grains may be broken and thus made more easily digestible.

Hot bread and hot rolls, the doctor says, unless well baked, contain living yeast organisms, or an excess of soda at times, conditions that render them unfit food for subjects of indigestion, and food to be used sparingly by others. Sugar is probably used in an improper manner more frequently than any other article of diet. It is a valuable food, but must be used with prudence by the well, and not at all, for a time at least, by those suffering from fermentative indigestion. Tea and coffee should not be taken strong, and in some cases should be avoided. Condiments should be used sparingly at all times. Wines and liquors are mentioned only to be condemned. It is necessary to view this question from a broad standpoint, as no two authors agree upon the food value and digestive action of wines and liquors. Doctor Stewart's experience leads him to conclude that alcoholic liquors not only possess no food value, but also tend to disturb digestion. An average course dinner contains from eight to fifteen articles of food and one to four separate kinds of drinks. This multiplicity of food articles is one of the commonest of the causes of indigestion.

Overeating is also condemned. "A small, properly selected, well-balanced, and carefully taken diet will be better assimilated and produce more nutritive effects than the meal of a glutton."

"The habit of closing every full dinner with desserts is very detrimental, and usually causes discomfort to the eater. Dessert after a satisfying meal is that much too much, and should be avoided."

That a fish diet, by reason of being rich in phosphorous, can furnish nutrition to nerve and brain is declared to be wholly fanciful. Also in the same category is the idea that the diet of a pregnant woman may influence the sex of her offspring.

In treating persons suffering from indigestion, the physician should be specific in his direction in every case. Advantage will be gained in many cases by putting these directions in writing.

PATHOLOGY.

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AND
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SPECIFIC SOMATOGENIC CYTOXINS.

THE idea of a serum that would damage or destroy one organ of the body, sparing the others completely, has dominated many laboratory workers, but the labors of these have brought forth only contradictory results. A year ago Beebe (*Journal of Experimental Medicine*, December, 1905) claimed to have produced, by repeated injection into animals of the nucleo-proteids of the liver, kidney and pancreas respectively, serums which, introduced into other animals, proved singly destructive to the liver, or to the kidney, or to the pancreas, according to which of these had been employed originally to yield the nucleo-proteid. Forthwith he proceeded to a clinical use of his findings, and there were soon reported cases of exophthalmic goitre much benefitted seemingly by an antithyroid serum. Manifestly a confirmation of these results would appear to bring those diseases dependent on tissue-hypertrophy or on its proliferation, as in the case of tumors, for instance, much nearer control.

It is important then to note the recent observations of Pearce and Jackson (*Journal of Infectious Diseases*, 1906, Number V, page 742).

They have carefully repeated the experiments fundamental to Beebe's work, with results only like enough to the original to suggest that Beebe's conclusions are based on errors of technic or of interpretation. Thus the changes this author noted in the urine of dogs treated with "nephrotoxin," they found could also be obtained with a "hepatotoxin," or with a serum supposed to injure the pancreas alone; while the peculiar reaction of the urine with Fehling's solution, induced, according to Beebe, by the toxin for the pancreas, and interpreted by him as dependent on a diabetes, they discovered to be not infrequently yielded by specimens obtained from normal dogs, especially when the technique of the test with Fehling's solution was faulty. The serums Pearce and Jackson obtained were in no sense specific, but gave rise to a slight degenerative process, generalized in nature. F. P. R.

EDITORIAL COMMENT.

VIEWS CONCERNING VENEREAL DISEASE.

THE question of prophylaxis with regard to venereal disease is receiving marked attention throughout the world, not only from the medical profession but from the laity as well. Germany inaugurated the crusade by establishing societies for the prevention of social disease, and American organizations of this nature are performing admirable work.

The subject evoked interesting and intelligent discussion at a recent meeting of the Philadelphia Society for the Study and Prevention of Social Disease. Doctor W. Travis Gibb, of New York, who has long been connected with the Society for the Prevention of Cruelty to Children, in the capacity of examining physician, disclosed the existence of some horrible conditions in the tenement district of the metropolis. The environment in which the people of this quarter dwell, the crowded condition of living and sleeping rooms with the consequent lack of privacy, affords opportunity for the perpetration of unspeakable crimes against women and children. During the fifteen years of his incumbency, the doctor has examined over eight hundred girls, ranging in age from eight months to sixteen years, upon whom rape and other crimes had been committed. Aside from the iniquity of the proceedings a veritable hotbed is afforded for the dissemination of venereal disease. Thirteen per cent of the children examined were infected—eighty-one per cent having gonorrheal vaginitis and two and one-half per cent chancroids. The small number of syphilitic cases is probably owing to the fact that examination was made before the disease developed. Notwithstanding the awful conditions disclosed, Doctor Gibb is of the opinion that only a small percentage of the crimes actually committed become known, owing to reticence on the part of the children.

The vast number of crimes committed and the horrible sanitary and domestic environment of the slum district would seem to call for the more careful attention of sociologic workers. Indeed such conditions are not confined to the lower classes, as was evidenced by the discussion of the question by Reverend Floyd W. Tomkins, S. T. D. The idea of placing the stigma of social crime entirely upon the woman, and allowing the man to resume his place in respectable society, was disgusting to the speaker. He urged the dissemination of truth through the medium of the public schools, and was of the opinion that boys and girls should be openly and frankly taught the dangers resultant from venereal disease, and the grossness of social crime. Marriage likewise received his consideration. The physical examination of the contracting parties by a competent physician was deemed desirable, and the clergyman should be furnished with a certificate from the examiner showing their freedom from venereal disease.

Another aspect of the case received the attention of Talcott Williams. This speaker believed the licensing and segregation of prostitutes to be the relics of our primitive development. These sham restrictions are not calculated to eradicate the vice. He expressed the opinion that within forty years society will abandon the outward manifestations of prostitution, but whether this will mean a suppression of the evil is not prophesied. Elevation of the age limit of consent would undoubtedly intimidate malefactors, and if it did not result in a regulation of this social evil it would tend to assure the conviction of criminals. In many European countries twelve is the age of consent, but the opinion was advanced that the limitation will soon be placed at between eighteen and twenty.

ANNOTATIONS.

SPLENIC IMPLANTATION IN CRETIN SUBJECTS.

Cretinism would seem to be amenable to surgical treatment if recent scientific discoveries are worthy of credence. After long animal experimentation with pieces of thyroid gland, which were implanted in the spleen, the technique has been so perfected that danger of troublesome hemorrhage is almost completely overcome. The most effective means of control is to make a pocket incision and insert the tissue therein, thus effecting a living tampon. Various methods of suturing have also been attempted, Pays utilizing the omentum as a cover for the incision. This investigator has conducted numerous experiments on animals from which the thyroid gland had been removed, and that transplanted thyroid would functionate was attested by the fact that the animals were kept alive for several months. The method was recently attempted on an undeveloped girl of six years, transplantation being made from her healthy mother. The results were pronounced gratifying both as to physical and mental development. The reaction is obtainable in both inherited and acquired athyrea, or in insufficient thyroid development.

CONGRESSIONAL LEGISLATION ON CONSUMPTION.

An interesting detail concerning medical legislation for the District of Columbia and the City of Washington was manifested in a discussion that occurred in the House of Representatives awhile ago relative to the registration of consumptives. The bill was an outgrowth of Doctor Wiley's statement that the bacilli of tuberculosis can be found in the mouth of every individual. Congressmen, after discussing the subject with the health department, physicians, and citizens, framed a bill much resembling the one operative in New York City, requiring the registration of all tuberculous individuals, the examination of all suspicious sputa, and the disinfection of the abode of a consumptive after his removal or death. It is seldom that so vital a medical topic comes before a legislative body and receives the free discussion that was accorded this one. Objection was raised to the passage of a measure that required the registration of individuals whose lungs were in an incipient stage, on the ground that many physicians might not consider the patient tuberculous at all, and further that such individuals frequently recover completely without other signs of the disease and were thus "marked" in the public health books. It was therefore amended that only those persons whose sputum contained the tubercle bacillus should be reported to the health department, and that as soon as the patient had recovered he might be registered in another book as "cured." Doctor Burton, a capable physician and representative from Delaware, was obliged to bear the brunt of the discussion and explain innumerable popular ideas that his fellow-congressmen brought into the argument before the bill was adopted. H. A. F.

A PIONEER AMONG MEDICAL PERIODICALS.

This number marks the advent of the twenty-ninth year of publication of **The Physician and Surgeon**. Many acquisitions, amalgamations and abscissions have occurred in the journalistic domain during this period. Some of the various arrivals could well have "died aborning," as their careers were sickly and their cessations unmourned. To be sure, some worthy contemporaries have lost their identity or have perchance died, just as some good people have died. Fortune has been particularly kind to this journal, however, not only by safeguarding against disaster, but by enhancing its value alike to physician and purveyor. The leading article in this issue bears ample testimony of the fact that The Physician and Surgeon is improving with age, and ensuing papers will corroborate this attestation. The elaborate contribution by Doctor Warthin is an experimental study of the tissue-changes produced by Roentgen irradiation, and is of practical diagnostic and therapeutic import. The article will be continued through three numbers, and will contain twenty-seven half-page photoengravings. Printers, engravers, and paper makers are responsible for the tardiness of this issue, but succeeding numbers will be published fortnightly until the journal is again on time.

MEDICAL NEWS.

DOCTORS ORGANIZE NEW GUILD IN DETROIT.

THE recently-established Detroit Medical Club bids fair to occupy an unique as well as useful place among the medical societies of the state. The club is designed to fulfill several purposes. At present the members are endeavoring to review current medical literature as completely as possible and to further discussion freely in the newer topics before the profession with a view ultimately of bringing problems of research before the members. Thus far two meetings, preceded by dinner, have been held at Hotel Normandie. The membership for the present has been limited to twenty-five. The officers are as follows: President, Doctor Walter J. Wilson, Jr.; vicepresident, Doctor Louis J. Hirschman; secretary-treasurer, Doctor James A. MacMillan; board of directors, Doctor H. Wellington Yates, Doctor Augustus Ives, Doctor Frank B. Walker; chairman of program committee, Doctor James E. Davis. The first paper read before the society appears elsewhere in this issue.

MINOR INTELLIGENCE.

COUNCIL BLUFFS, Iowa, is to have a new city hospital. Treatment will be limited to surgical diseases and maternity cases.

MOUNT SINAI Hospital, New York City, is the recipient of a bequest of $5,000, in the will of the late Henry Meinhard, of that metropolis.

A GERMAN publication reports the case of a patient who contracted scarlet fever seven times. The first attack occurred at the age of seven and the last at twenty-four.

OSTEOPATHS are striving to gain practice rights in Texas, a bill being now before the legislature of that state for the establishment of a board of osteopathic examiners.

By the will of the late Governor Frank Wayland Higgins, of New York, the Olean General Hospital, situate in the town of Governor Higgins' adoption, receives $10,000.

A Pasteur Institute has been established in Saint Louis, with Doctor Downey L. Harris in charge. The institute is located in the city bacteriologist's office, where five rooms have been equipped and treatment will be accorded gratis.

A vaccination bill was recently introduced into the legislature of Massachusetts by Doctor Charles Harrington. Adverse criticism was mostly to the effect that compulsory vaccination is unAmerican and the combatants compared such legislation to Russian tyranny.

After twenty years of successful publication, *The Brooklyn Medical Journal* has been discontinued, the last issue appearing in December, 1906. In its stead appears the *Long Island Medical Journal,* which is the conception of the associated physicians of the island.

The legislature of Nebraska is considering the adoption of a bill to compel Christian Scientists to pass state board examinations in physiology, hygiene, bacteriology, pathology, symptomatology, and diagnosis, and to limit their practice to diseases without the province of the surgeon.

The second International Congress of Physiotherapy will be held October 13, 14, 15 and 16, 1907, under the presidency of Honorable Professor Guido Bacelli. The American committee comprises Doctor Francis B. Bishop, of Washington, and Doctor William B. Snow, of New York City.

An ordinance was recently introduced into the common council of Chicago, to compel street railway companies to furnish every car with first-aid materials. Physicians are frequently called to street railway accidents who are unprovided with dressing materials, and hence the effort to secure municipal provision.

Doctor Thomas Darlington, Health Commissioner of New York, has inaugurated a novel means of teaching the public regarding the ravages of tuberculosis and the means of combatting its spread. A series of shows will be given in parks and amusement places for the purpose of portraying by means of stereopticon the process of the disease.

The Northern Tri-State Medical Society held its thirty-fourth semiannual meeting at Elkhart, Indiana, January 8, 1907, under the presidency of Doctor Charles D. Aaron, of Detroit. The program announced twelve papers on important medical and surgical topics. Doctors Dock and Darling, of Ann Arbor, were listed to participate in discussions, and Doctors Hickey, Ohlmacher, and B. R. Shurly, of Detroit, to contribute papers. The Elkhart County Medical Society entertained visiting physicians at a banquet.

GEHEIM-RAT PROFESSOR DOCTOR WILHELM EBSTEIN, of Göttingen, recently attained his seventieth year. His birthday was celebrated at the University in which he has been at the head of the department of clinical medicine for many years. The *Deutsche Archiv für klinische medicin* published a festschrift in his honor.

RUMOR says that the coal mines are shortly to be equipped with ambulances in the shape of cars—modelled after the ordinary mule car, but provided with upholstered cots and complete surgical armamentaria. These vehicles will greatly facilitate the work of the miners' first-aid corps, and will be much appreciated by the workers.

SAINT LOUIS has a Hospital Saturday and Sunday Association, whose function it is to collect and receive subscriptions for the maintenance of the various hospitals. The collections of this praiseworthy organization amounted, in 1905, to over $30,000. Last year's collection, which was taken on December 1 and 2, aggregated over $40,000.

ONE of the worthy functions given annually in New York is the German Charity Ball, the proceeds of which are donated to philanthropic purposes. Last season's ball netted $11,000, of which the German Hospital and Dispensary receives $2,000; and Saint Francis Hospital, Saint Mark's Hospital, and the German Polyclinic, each receive $1,300.

THE bursting of a hot water bag with consequent scalding of a patient anesthetized, is responsible for the commencement of a malpractice suit for $10,000 damages against three Saint Louis physicians. The plaintiff contends that during an appendicitis operation, part of the skin of one leg was removed, while defendants declare that the loss of skin was due to scalding.

EUROPEAN report discloses a death from the administration of 0.2 grammes of calomel, given eight times during three days. The victim was a man, fifty-six years of age, and death ensued twenty-four hours after the final ingestion. Various degrees of idiosyncracy against calomel are known to exist, but death from the assimilation of so small an amount is indeed rare.

THE Sixth Annual Dermatological Congress will convene in New York City, on September 9, 1907, under the presidency of Doctor James C. White, of Boston. The congress was inaugurated in Paris in 1889 and subsequent meetings have been held in Vienna, London, Paris, and Berlin. Doctor Andrew P. Biddle, of Detroit, is a member of the Committee on Organization.

DOCTOR PRESTON M. HICKEY, of Detroit, has been elevated to the editorship of the newly established *American Quarterly of Roentgenology*. The publication is the property of the American Roentgen Ray Society, and emanates from Pittsburg, Pennsylvania. It succeeds the transactions of the society which have hitherto appeared yearly and occupies an important field in medical literature.

SELDOM in this country does a physician take an active part in political affairs. In France this is far from being an uncommon occurrence. George Clemenceau, banished by Napoleon in 1868, came to New York and established a practice. Later he returned to his native country and busied himself with public affairs. At present he is taking a prominent part in the struggles that exist between the Church and the State.

THE cemetery question which has long been neglected in the Philippines has lately come under legislative regulation. Heretofore interments have been more or less promiscuous, without regard for place or sanitary requirement. A law recently enacted specifies that hereafter it shall be unlawful to establish, maintain, enlarge, or remove any burial ground or cemetery until a permit shall have been obtained from the Board of Health.

RECENT LITERATURE.

REVIEWS.

ABDOMINAL OPERATIONS.*

IT is not long since the first edition of this admirable work was reviewed in the pages of this journal. It was our opinion then that the setting given the latest thought and practice of abdominal surgery would be warmly received, and so it has turned out. The author has taken advantage of the occasion to make a number of additions as well as some revision. We have no hesitancy in recommending this work again to any one interested in abdominal surgery, who may not yet be acquainted with its value. F. B. W.

*By B. G. A. Moynihan, M. S. (London), F. R. C. S., Senior Assistant Surgeon at Leeds General Infirmary, England. Second revised edition, greatly enlarged. Octavo, 815 pages, with 305 original illustrations. Cloth, $7.00 net; half morocco, $8.00 net. Philadelphia and London: W. B. Saunders Company, 1906.

ATTFIELD'S CHEMISTRY.*

THIS very thorough work by a chemist of international repute contains sections on both organic and inorganic chemistry, together with chapters on qualitative analysis and chemical toxicology. Four charts serve to elucidate the work in analytical reactions:—a scientifically compiled table of the first six groups; a "Synoptical Table Showing the Relations between the Principal Members of the Paraffin, Benzene, Naphthalene and Anthracene Series of Hydrocarbons and their Derivatives"; a "Table to Aid in the Identification of Official Alkaloids, Glucosides, et cetera"; and a "Table for the Qualitative Analysis of Ordinary Scale Compounds." The volume is quite sufficiently illustrated and the description of laboratory apparatus easy of comprehension. The classification of the chemical elements and compounds simulates the ordinary grouping in text-books and manuals. Altogether the work is to be highly commended and will prove a valuable acquisition to the library of persons engaged in medical, pharmaceutical, or chemical pursuit.

*General, Medical, and Pharmaceutical, Including the Chemistry of the United States Pharmacopeia. A Manual of the Science of Chemistry and its Applications to Medicine and Pharmacy. By John Attfield, F. R. S., M. A., Ph. D., F. C. S., et cetera, Professor of Practical Chemistry to the Pharmaceutical Society of Great Britain, et cetera. New (nineteenth) edition, specially revised by the author to accord with the New United States Pharmacopeia. Edited by Leonard Dobbin, Ph. D., F. I. C., et cetera., Lecturer on Chemistry in the University of Edinburgh, et cetera. 12mo, 760 pages, illustrated. Price: cloth, $2.50, net. Lea Brothers & Company, Philadelphia and New York, 1906.

CONSUMPTION—ITS RELATION TO MAN AND HIS CIVILIZATION: ITS PREVENTION AND CURE.

THE combat with consumption is not likely to languish for want of special literature. The important thing is that this literature be put in the hands of those who need it, and its lessons carried home. We recently reviewed the little book of Doctor Francine. Doctor Huber's book, now under consideration, differs materially from it in size. It contains almost everything needed by the general reader on the subject of tuberculosis and its pathologic, sociologic, and therapeutic relations. It is thoroughly illustrated by 131 cuts, ranging all the way from Botticelli's Venus and tubercle bacilli to the atmosphere in Hester street, New York, a healthy cow, a consumptive cow and a great variety of sanatorial buildings of all kinds. In fact the work may be looked on as an encyclopedia on its subject, and is written in an easy, even colloquial style. It is a book that the doctor may, with advantage, not only read himself but leave on his waiting room table as a valuable substitute for much of the literature that finds its way there. An appendix gives many practical directions regarding disinfection, treatment, construction of buildings, et cetera. The book is well printed on paper a little too heavy for the purpose, and the half-tones, though useful, are very often poorly executed. We regret to see such a word as "tubercular" where tuberculous is meant, but this and some other verbal peculiarities are only trifling defects in so useful a work, G. D.

*By John Bessner Huber, A. M., M. D. Philadelphia and London: J. B. Lippincott Company.

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ORIGINAL ARTICLES.

MEMOIRS.

LYMPHOCYTOMA, WITH PROMINENT LESIONS IN THE INTESTINAL LYMPHATIC APPARATUS AND IN THE SALIVARY GLANDS. (PSEUDOLEUKEMIA SEU LYMPHOSARCOMATOSIS INTESTINALIS AUTORUM.)

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INTRODUCTORY.

THE literature concerning tumor-like conditions of the lymphatic system, in which the histologic picture resembles normal lympadenoid tissue, is very rich. The tendency of the disease to affect the lymphatic structures of the small intestine is so marked that many of the cases are recorded under the head of intestinal tumors. While it is possible from the gross and microscopic descriptions to classify a considerable number of these cases under one head, the nomenclature is, at first sight, hopelessly confused.

There can be no doubt that there is a wide diversity of tumor-like affections of the intestinal lymphatic system, and yet this diversity is one of degree and not of kind, for all of the tumors which we are to consider have as their essential elements either mature lymphocytes or parent cells such as are found in the germ centers. One extreme is represented by an enlargement of the mesenteric glands and a general or localized hyperplasia of the follicles and patches, with slight tendency to invasion of contiguous structures and no destruction of tissue. In this form the histologic picture is that of a normal lymphadenoid tissue, which has uniformly replaced the other elements of the gland or follicle, the distinction of lymph-follicle and sinus being no longer discernible. The predominating cell-type corresponds with the small lymphocyte of the circulating blood and is usually indistinguishable from the lymphoid cells entangled in normal lymphadenoid tissues. At the other extreme there is a group of tumors which is characterized by destructive and invasive propensities. The gland capsule is infiltrated, the retroperitoneal and other adjacent tissues are attacked, the intestinal musculature is invaded, and not infrequently ulceration occurs. The histologic picture in these cases is quite different from the normal lymphatic structures. There are large cells of varying sizes and shapes, with pale vesicular nuclei. Mitoses are abundant, and multinucleated cells not infrequent. Intermingled with these cells are relatively small numbers of small lymphoid cells. Between these extremes there are cases which may be regarded as transitional in their histologic make-up and in their clinical course. The first type is usually designated pseudoleukemia, lymphoma, or lymphadenoma, while the obviously more malignant type is usually reported under the head of lymphosarcoma or lymphosarcomatosis. Inasmuch, however, as in all cases the lymphocytes are the tumor elements, and the growth is more or less invasive in character, there seems to be good reason for following Ribbert,[1] in uniting the variously named conditions under the head of *lymphocytoma*. It is to be borne in mind that as far as the pathologic histology is concerned, there is no difference between the lesions in lymphatic leukemia and lymphocytoma. The only difference is that in leukemia the new cells gain access to the circulating blood in such numbers as to give the familiar blood-picture.

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In the present case there was no increase in the white cells in the blood, and the mature lymphocytes are the predominant and, in fact, almost the only elements present in the tumor masses, hence the case belongs to the group reported as intestinal peudoleukemia, lymphomatosis, or much more properly aleukemic lymphadenoma. Notwithstanding the absence of atypical cells and the comparatively benign appearance of the lesions, microscopically and in the gross, there are distinct evidences of infiltration in the intestinal musculature, which would lead many to regard it as the lymphosarcomatosis of Kundrat. This difficulty in choosing a suitable name, has, among other reasons, led to the adoption of Ribbert's term *lymphocytoma*. Then, too, this designation is more in accordance with the usual rules of tumor-nomenclature than the previously used terms, and at the same time it implies a belief in the unity of the lymphadenoid proliferations.

On account of the interest attached to the conditions of the salivary glands and the additional facts brought out on repeated examinations of the abdomen, the clinical history is reproduced with but few omissions and abbreviations. It is a pleasure to thank Professor Dock and Doctor Morris for the privilege of reporting their observations.

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[1] Geschwulstlehre, Bonn, 1904.

CLINICAL HISTORY.

H. M., American, married, aged sixty-eight. Admitted to the University Hospital, October 29, 1904. Discharged, November 10, 1904.

Patient entered hospital at advice of Doctor Dock, on learning that he was dropsical, besides having the dry mouth, for which he was being treated.

Diagnosis.—Xerostomia; abdominal tumor (tuberculosis of peritoneum, carcinoma (?)); ascites; edema of legs; achylia.

Family History.—Patient's father died at age of eighty-seven of old age, mother died at age of eighty-seven, old age. Maternal grandfather died at ninety-six, and grandmother at ninety-four from old age. No definite knowledge of paternal grandparents. Patient has one brother living and in good health, one brother died of "catarrhal consumption." Had three sisters, two living and in good health, one died during confinement. No history of cancer or tuberculosis.

Personal History.—Patient had diseases common to childhood, but made good recovery from all. Otherwise patient has been in excellent health up to beginning of present ailment (says he has not known a day's sickness).

Present ailment dates from March, 1903. Its onset was very sudden. Patient attempted to eat some lunch and found he was unable to swallow on account of dryness of mouth; there was no saliva and food remained dry. There was no muscular affection, simply dryness of mouth. Patient says he had never noticed the dryness of mouth or experienced any difficulty in swallowing before. He can take dry food such as bread only by washing it down with some liquid. This condition has been constant since its onset. Last June patient noticed that the parotid glands began to swell. A short time later a swelling was observed under jaw on each side (submaxillary glands). They have gradually increased in size, they have never caused any pain, and are not tender on pressure. Last July patient began to experience stomach affection. His stomach would bloat after eating certain foods, such as cabbage or beans, and he would have eructation of gases. There was no pain, no vomiting. The condition of bloating has been constant since the first of September. Since last spring patient has had a mild diarrhea. For the past six weeks patient has had bloating in ankles. Patient has used tobacco from sixteen years of age until thirty-six, and again for the past nine years, a part of the time to excess. Patient has lost about twenty-seven pounds in weight, and is quite weak. Has no trouble in urination. Has from two to four stools every day. Sleeps fairly well.

Urine.—Quantity, 450 cubic centimeters, pale-yellow in color; reaction, acid. All chemical tests negative, except for indican which gives a faint blue. Very small amount of sediment, containing few oxalate crystals and few epithelial cells (October 30, 1904).

Blood.—Red corpuscle count, 4,240,000 per cubic millimeter. Leucocyte count, 11,204 per cubic millimeter. Hemoglobin, 80 per cent.

Stomach Contents.—Test meal, shredded wheat biscuit. Withdrawn at the end of one hour. Quantity, 40 cubic centimeters. Lavage showed bits of test meal and mucus. Free and loosely combined hydrochloric acid absent; total acidity, 4. Lactic acid absent. Peptic digestion, 8 millimeters (Mett). On microscopic examination very few long bacilli are seen (October 27, 1904). Examination of stomach contents under similar conditions on the 28th and 29th of October yielded practically the same results.

STATUS PRAESENS.

October 31, 1904, Doctor Roger S. Morris.—Temperature, 99°; respiration, 24; pulse, 100, fair size and tension. Vessels thickened, tortuous. Usual weight 147 to 150 pounds. Height 5 feet 8½ inches. Frame rather small. Panniculus absent. Muscles soft, flabby, and small. Skin dry, smooth, and dark-sallow. Few enlarged venules just over ensiform and below lower lung borders in front. Feet and ankles show moderate edema. Veins of legs show slight varicosity. Genitals darkly pigmented. There is a hernia in right inguinal canal giving impulse on coughing which can be reduced, but it returns immediately. Feet and hands cold, slightly cyanotic. Slight enlargement of the axillary lymph glands. In the parotid region on each side there is a rather firm but elastic swelling, which extends over the jaw and in front of ear. Patient says palpation started a little saliva on left side. Below ramus of jaw on each side is a swelling the size of a pigeon's egg. Palpation of these masses started no saliva. Venules on check and nose slightly enlarged. Face somewhat pale and sallow. Pupils equal; react well; sclerotics rather muddy, not icteric; conjunctivæ injected. Lips, rather pale. Teeth wanting except for six lowers in front and an upper molar; they are covered with a grayish-brown deposit, caries. Gums swollen and red. Tongue clean, dry, red. Roof of mouth looks moist. Pulsation over neck.

Thorax.—Fair depth and length. Epigastric angle about 90°. Angle of Louis prominent. Lower edge of sternum depressed. Fullness over third, fourth, and fifth intercostal spaces to the left of the right parasternal line. Expansion rather slight and symmetrical, thorax moving as a whole. Hyperresonance on percussion, more marked on left front. Note almost tympanitic in right axilla. Lower border of lung in the fifth intercostal space in right nipple line, and extends straight across. Vesicular breathing increased throughout, but more marked on the left. No adventitious sound. Back clear on percussion. Auscultation negative.

Heart.—Apex beat barely visible under nipple in the fourth intercostal space. Sounds strongest about two centimeters inside nipple. No palpable impulse. No absolute and only slight relative dullness.

On auscultation the vesicular breathing is very loud over the region of the heart, rendering the heart sounds almost inaudible. When patient holds his breath, sounds are weak and distant, the first somewhat impure. Pulmonic sounds almost inaudible; aortic second of fair strength. Over ensiform the second sound is divided and the first is roughened. There is a metallic quality to all the sounds. Breath sounds, both on inspiration and on expiration, are well heard here, but weaker than in the precordium. No murmur heard towards right.

Abdomen.—About one inch above the level of the ribs, bulging in the flanks; full all over. Superficial veins distended above pubis, in flanks, and about umbilicus, which latter is flattened but does not protrude. Well marked movable dulness in flanks. On palpation walls are moderately lax, nothing made out on dipping. No fluctuation wave. Tympany above pubis in recumbent posture; relatively dull on sitting up. Measurements: circumference at navel, 34¼ inches; pubis (symphysis) to navel, 6¾ inches; pubis to top of ensiform, 12¼ inches. With the patient in the knee-elbow posture there is dulness over the abdomen with tympany high in the flanks. Knee-jerks present. Ankles: left, one inch above maleoli, 8½ inches; right, one inch above maleoli, 9 inches.

November 1, 1904, Doctor Morris.—A probe could be put into the parotid gland ducts; no saliva escaped; ducts were small. Stethoscope makes distinct impression in skin of thorax. Diarrhea affects patient mostly from midnight until noon, from noon to midnight he is usually free from it. From two to six loose movements in a night. Stool: light clay-colored; not watery; corn and beans appear in stools unchanged; no blood, no mucus. Veins above pubis extending up toward navel, enlarged. Same condition on both sides of abdomen extending almost to axillæ. Abdomen more dome-shaped than yesterday; moves with respiration. Abdomen 1 inch to 1½ inch above level of ribs. On dipping below and to left of navel and over navel there is a deep, indefinite resistance. A faint fluctuation can be obtained, but it seems distant and varies. There is an enlarged area of liver dulness, but the liver cannot be palpated on account of tenseness of abdominal wall. Measurements: circumference at navel, 33¾ inches; symphysis to navel, 6⅞ inches; symphysis to ensiform, 12½ inches. Patient insists that abdomen began to swell before ankles, probably not six weeks since ankles swelled, and abdomen began in July.

November 6, 1904.—Patient feels well except a little weak from taking salts. Mouth looks fairly moist, buccal membrane is smooth, shiny, and glistening. Tongue is red and somewhat moist. Patient says he has not talked much this morning and that is why his mouth is not so dry. A number three lachrymal probe was inserted into the left parotid duct. Probe entered easily and when it was withdrawn and the gland slightly pressed upon, two or three drops of saliva exuded.

The right duct also probed for the same distance and when the probe was removed, patient said he could taste the saliva on the right side. Patient says he has tasted the saliva on the right side only once a week or so, while he notices it on the left side every day. Submaxillary and sublingual ducts could not be found.

Blood.—Red corpuscles, 3,960,000 per cubic millimeter. Leucocytes, 11,457 per cubic millimeter. Hemoglobin, 80 per cent.

NOVEMBER 7, 1904, Doctor George Dock.—Abdomen at navel measures 30½ inches. Abdomen is quite soft and easily palpated. There is a mass extending from the navel to the right parasternal line and to the left parasternal, midway between navel and symphysis. Just below the navel is a very superficial mass feeling about as big as a finger, forming about a half circle and having a small mass about an inch long extending out from the inner end. The mass is freely movable, hard, not elastic, but cannot be indented. Below this is a larger, indefinite mass extending to the right as mentioned. None of the masses are affected by breathing, but the superficial lump can be moved all around for about three inches. No masses in upper part of abdomen. Patient did not know of these masses, but says that he has had pain in that part of abdomen four times following the eating of indigestible food. Had griping pain followed by distension, relieved by an emetic or injection. No edema in legs. Patient feels weak, thinks mouth is not so bad as before.

Urine.—Quantity, 600 cubic centimeters; specific gravity, 1.018; reaction, acid; color, reddish-yellow; tests for albumin, sugar, and indican, negative. Sediment small in amount and white, containing a few leucocytes, and a few small hyalin casts.

NOVEMBER 8, 1904, Doctor George Dock.—Patient says mouth feels as though there was a coating all over it. Buccal surfaces, smooth, pink, and shiny. Tongue red, slightly moist, thin white coat in middle and back part of tongue. Patient chewed paraffin for forty-five minutes and said he swallowed quite a bit of saliva during that time. No saliva could be seen exuding from ducts before patient began with the gum, but two or three minutes after he stopped chewing it, saliva could be seen coming from the right Steno's duct. None from left or beneath tongue. Abdomen is not as full, and veins look larger. Scratches are marked over abdomen. There is a retraction of the wall between navel and ensiform. Masses described in the lower left part of the abdomen are of the hardness of cartilage. Measurement at navel, 30½ inches. Abdominal wall is thin and skin is loose. Patient has hemorrhoids. By rectal palpation one can get near the lower pole of the mass; no nodules; no sharp edges to be felt.

NOVEMBER 10, 1904, Doctor George Dock.—Abdomen the same as yesterday. Edge of liver can be felt half way between ensiform and navel and feels rather hard; edge is thin; surface feels uneven, but this may be due to granular abdominal fat. Patient was advised about possibility of operation. His son came out, and said that patient would not consent to exploration. Told of possibilities.

* * *

After leaving the hospital patient returned to his home in Detroit, where he remained up to the time of his death. There was little change in his condition according to the statements of his attending physician and relatives. The xerostomia persisted, necessitating the consumption of large quantities of liquids to facilitate deglutition. The diarrhea abated, but lasted almost to the end. The fluid reaccumulated in the peritoneal cavity and he was tapped by his attending physician. Without the development of any new symptoms, patient became progressively weaker, and died April 17, 1905.

Through the efforts of Doctor Dock permission for an autopsy was obtained. This was done by me in the home of the deceased 11½ hours after death.

AUTOPSY.

Length 159 centimeters. Body heat absent. Rigor present throughout. Emaciation marked. Panniculus moderate. Abdomen on a level with ribs. Edema of lower extremities and scrotum. Mucus membranes pale. Teeth absent. Hair grizzled. Bilateral enlargement in parotid regions, the right being much the larger; overlying skin adherent. Axillary, inguinal, and supraclavicular lymph nodes enlarged, firm, and movable beneath skin. Deep depression at tip of sternum. Puncture marks scattered over abdomen; undertaker's incision in right femoral region.

Panniculus orange-yellow and scanty; abdominal muscles thin, pale reddish-pink. Omentum: adherent to parietal peritoneum; displaced to left and coiled upon itself; thick and firm; pinkish red in color and studded with gland-like fatty villosities. The parietal peritoneum is thickened and its blood-vessels injected, but it still retains its lustre. Colon prolapsed in a U-shaped fashion, almost reaching umbilicus. Appendix in posterior position, coiled upon itself, tip adherent. Several hundred cubic centimeters of slightly turbid, reddish fluid in peritoneal cavity. Mesentery converted into a dense hard mass, containing enormously enlarged lymph glands. Coils of small intestine much distended, especially those passing over the mass in mesentery. Liver margin 7.5 cubic millimeters below xiphoid. Diaphragm reaches upper border of fifth rib on right, fifth intercostal space on left.

Costal cartilages slightly ossified. Mediastinal fat abundant. Thymus fat almost absent.

Left pleural cavity contains about 200 cubic centimeters of greenish-yellow, turbid fluid with abundant flakes of fibrin. Recent adhesions over lower lobe.

Right pleuræ free from adhesions; small quantity of thin clear fluid in cavity.

Pericardium contains about 75 cubic centimeters of blood-tinged fluid. Cavity free from adhesions.

Heart.—Smaller than patient's fist. Epicardium smooth. Subepicardial vessels tortuous and thickened. Mitral orifice slightly contracted. Free margin of valve puckered by nodular fibrous thickening. Tricuspid valve shows similar change. Pulmonary valve negative. Aortic cusps slightly thickened and stiff. Coronaries thick and rigid but patulous. Tips of papillary muscles fibrous. Myocardium brownish-red. Left ventricle measures 10-15 millimeters in thickness. Right ventricle measures 5-7 millimeters.

Left lung.—Voluminous. Puckered scars in apex. Base firm and dark red. Lateral and anterior aspects covered with fibrin patches. On section: the lower lobe is dark red; slight amount of fluid-blood expressed. Upper part of lower lobe is consolidated; surface granular. Throughout the cut surface are small whitish nodules from the size of a pin-point to that of a pin-head. Advanced carbon deposit.

Right lung.—Crepitant throughout. Cut surface grayish and slightly moist. Submiliary pin-head nodules are scattered throughout.

Bronchi and bronchioles contain a small amount of mucopurulent material. Lymph nodes enlarged and deeply pigmented.

Spleen.—Slightly enlarged, measuring 12.5 x 4.5 x 7.5 centimeters. Surface covered with numerous firm raised whitish patches. On section it is firm; cut surface grayish-red; follicles visible and pulp cannot be scraped. Trabeculæ prominent.

Left kidney.—Irregular in shape. Firm. On section; markings not distorted; labyrinth, opaque and of a slightly yellowish hue; cortex measures 6-8 millimeters. Capsule not adherent. Surface fairly smooth, slightly granular in places. Pelvic fat not excessive. Vessels slightly thickened.

Right kidney.—Small, more irregular in shape. Few retention cysts on surface. 8 x 5 x 3.5 centimeters. Otherwise similar to left.

Adrenals.—Atrophic and pale.

Mesenteric glands enlarged and fused into a board-like mass at root of mesentery. Retroperitoneal glands moderately enlarged. Hemolymph nodes pale pink in color and slightly enlarged. On section, the enlarged lymph nodes are firm, smooth, glistening, homogeneous, and grayish-white. Little or no cell juice can be expressed. The largest mesenteric gland measures 6.5 x 3 x 3.5 centimeters. The root of the mesentery is thickened to the extent of 0.5 to 1.0 centimeters, and is of the same homogeneous glistening appearance. The first 25 centimeters of ileum commencing at the ileocecal valve are free, the next 40 centimeters are drawn closely to the enormously thickened radix mesenterii. Near the middle of these coils there is a saccular dilatation in the gut, 18 centimeters in length. Here, the wall is thickened and stiff. On opening the gut, the mucosa of this dilatation is studded with closely packed grayish white nodules, roughly lenticular in shape, and extremely irregular in size. The lymphoid apparatus of the remainder of the small intestine and large intestine is not abnormally prominent.

The *stomach* contains a small quantity of grayish-yellow, turbid fluid. The wall is extremely thin; the mucosa smooth and thin, and beneath it plexuses of large, tortuous veins are seen.

Portal vein negative; lymph nodes in vicinity enlarged. Superior and inferior mesenteric vessels dilated and tortuous.

Liver.—Pale and mottled. Surface slightly granular. Consistence firm. Lobuses small, parenchyma pale-yellow. Scattered whitish pinpoint nodules visible on cut surface. Gall-bladder contains a thick brownish-black bile.

Pancreas.—Firm. Gray in color. On section; lobules small, fibrous tissue abundant. Lymph glands about pancreas moderately enlarged.

Aorta presents numerous, irregular, raised, firm, yellowish plaques. Arch is partially calcified.

Urinary Bladder.—Distended with turbid urine. Walls thin. Mucosa of bladder pale and atrophic.

Prostate.—Enlarged and moderately firm. Fibrous tissue predominates, glandular elements inconspicuous.

Thyroid.—Left lobe measures 5.5 x 3.5 x 2.5 centimeters. Substance pinkish-red and soft. On the left there is a free body, measuring 0.8 x 0.6 x 0.7 centimeters, similar in all respects to thyroid tissue.

Tongue.—Pale. Papillæ prominent.

Submaxillary Glands.—Enlarged and firm. Surface grayish-white and traversed by dense whitish fibrous bands.

Right Parotid Gland.—Adherent to overlying skin through a dense fascia. Duct scarcely admits a large probe, but is patulous. Gland substance firm, of a yellowish-pink hue, and marked off by dense fibrous bands. Almost no cellular material can be expressed.

Inguinal, axillary, and supraclavicular lymphnodes are enlarged, being on an average about the size of a hazel-nut. Cut surface is smooth, glistening, homogeneous, and grayish white.

Bone marrow from right tibia is yellowish-pink, apparently normal yellow marrow.

The brain and spinal cord were not examined.

Owing to the fact that the body had been injected with undertaker's fluid eight hours before the autopsy, cultures and animal inoculations were not attempted. Many sections of the mesenteric glands and ileum were stained for tubercle bacilli, but always with a negative result.

HISTOLOGIC EXAMINATION.

The *parotid gland* is divided into coarse lobules by broad bands of dense fibrous tissue. The lobules are of an almost uniform deep-blue color. Relatively small areas are much lighter in color and upon close examination are seen to be composed of collections of acini. The ducts are easily recognized, especially those which have considerable fibrous tissue in their walls. The bulk of the gland, however, consists of a vascularized lymphadenoid tissue. The cells are quite uniform, are round or slightly polyhedral, and contain a single deep-blue nucleus (usually 6-8 microns in diameter) with one or two nucleoli; the surrounding rim of basophilic protoplasm is so narrow that it frequently escapes detection at first sight. Save for a few reticular plates, cells differing from this type are extremely rare. Occasionally a cell with similar characters but two or three times as large is seen. Mitoses are very scarce and are typical. Multinucleated cells are not encountered. The rather numerous small vessels which traverse the lymphoid tissue possess a very delicate wall, apparently a single layer of endothelium forms the wall of most of them. There is a moderate amount of hemosiderin within large phagocytes. The *capsule* is very thick but neither it nor the interlobular bands are extensively infiltrated. It is true that there are small collections of lymphoid cells about every blood vessel, and that there are seen occasionally solid cords of these cells, but the predominating element is a dense collagenous substance in which there are a few spindle-shaped nuclei.

Mass of Mesenteric Lymph Glands.—The distinction between follicle and sinus is wholly lost. The remains of fibrous tissue bands give just a suggestion of a small lobular arrangement which is apparent even to the naked eye. The tissue is composed almost entirely of densely packed lymphoid cells which are usually round though frequently altered in shape by mutual pressure. The nucleus (6 microns in diameter) is siuated at one side of the cell and has strong affinity for nuclear dyes, the chromatin being in a dense, granular or reticular arrangement. There is usually a narrow rim of basophilic protoplasm. Numerous small blood vessels course through this tissue, and occasionally large veins with thin walls are seen. The walls of a few of the small vessels contain a thick coat of hyalin material. Hemosiderin is quite abundant and is usually contained in large phagocytes. The *capsule* is infiltrated to such an extent that it is no longer recognizable.

With a few modifications this description applies to all of the superficial glands examined—supraclavicular, axillary, and inguinal. In these glands the lymphoid cells are not so densely packed, the vascularization is not so marked, and, naturally, large veins are not encountered. The capsule is affected to the extent that there are perivascular collections, and occasional solid cords of lymphoid cells, but there is not a diffuse infiltration.

Wall of the Dilatation in the Ileum.—The mucosa is extremely atrophic. Here and there are a few glandular elements buried in a dense accumulation of lymphoid cells. Collections of lymphoid cells varying in size from that of a normal solitary follicle up to five or six times that size are numerous, but they differ from normal follicles in not being sharply defined. Instead they fade almost indiscernibly into the relatively loose lymphoid tissue about them; in fact, the large ones are continuous with the diffuse lymphoid infiltration in the muscular coats. This latter is largely replaced by a moderately vascular lymphadenoid tissue. The remaining muscle is present in two forms—fairly large bundles, and small columns of fibers between which are cords of lymphoid cells. External to the last demonstrable muscle fibres there is a rim of lymphoid tissue almost 1 millimeter in width extending to the peritoneal endothelium.. The cells in this new tissue are similar in all respects to those in the mesenteric lymph glands, parotid gland, et cetera.

Sections from other portions of the Ileum.—The mucosa is atrophic and contains many cyst-like spaces, especially in the tips of the papillæ. The follicles and Peyer's patches are not unusually prominent; the muscle is atrophic but unaffected by the lymphadenoid process; beneath the serosa, however, there is a slight, almost continuous band of lymphoid material.

Appendix.—The glandular elements are absent, and the lumen is completely obliterated by a dense fibrous tissue. The musculature is thinner than usual. The most interesting feature is the complete collar of lymphoid tissue between the muscle and the peritoneal endothelium. At the tip the picture is similar, and the fat in the mesoappendix contains an abundance of lymphadenoid tissue. The lymph node at the tip shows the same changes as do the mesenteric and superficial glands.

The *root of the mesentery* does not show a diffuse infiltration, but the direction of the lymphoid proliferation seems to have been guided by the blood-vessels and dense connective tissue bands which gives the effect of a coarse alveolar arrangement. This appearance is also seen when the adjacent fat is involved in the lymphoid process.

The *omentum* is converted into a vascular lymphadenoid tissue.

Stomach.—The mucosa is represented by a thin rim of lymphoid tissue in which a few glands of an indifferent type are buried. No specialized cells are demonstrable. The vessels in the submucosa are markedly distended, and the contained blood shows a leukocytosis with a slight predominance of polynuclear cells. The muscular coat is extremely atrophic. There is a slight subserous accumulation of lymphoid cells but it is not continuous as in the ileum and appendix.

Spleen.—The follicles are not conspicuous, and there is no new lymphoid tissue here. The capsule is considerably thickened, and the reticular connective tissue is moderately increased.

Liver.—Throughout the liver there are numerous collections of lymphoid cells, usually in the portal tracts. Not all of the portal areas seen in a section are affected, however, and beneath the capsule of the liver there are also small lymphoid nodules. The outline of the collection is usually circular, though when a portal vessel is viewed in longitudinal section the accompanying group of lymphoid cells is frequently at one side and oval in outline. The cells are similar in all respects to those in the mesenteric glands, omentum, et cetera. The same vascularity is also marked. The parenchyma shows a high grade of pigment atrophy.

Small lymphoid collections are found in the *kidneys* accompanying the vessels of the arterial arches. They are found most frequently at irregular intervals throughout the cortex and about the line of junction of the cortex with the pyramids. In this organ the nodules are much less numerous and are much smaller than in the lungs and liver; their outline is more indefinite and the vascularity is less marked. There is a low grade of chronic nephritis present.

In the *adrenals* there are numerous, extremely small groups of lymphoid cells. Frequently only fifteen to twenty cells can be counted in a collection. They have no definite outline but seem to insinuate themselves between several cords of adrenal cells. They are not vascular and are found both in the cortex and medulla.

Left lung.—Sections from the base show extreme atelectasis. Lymphoid collections are scattered throughout the lung, but in the almost airless portion the process is much more obvious and the nodules are closer together. They are situated in the peribronchial connective tissue and contain numerous small blood-vessels with very thin walls. The type of cells is farly uniform, and in fact, differs in no way from the predominating type in the mesentric glands, the parotids, the omentum, et cetera. There is a marked subacute fibrinous pleurisy, with a very striking accumulation of lymphoid cells in the loose subserous tissue and around the blood-vessels.

Right lung.—Sections from the apical portion show an isolated fibrocaseous mass. In general the lung is emphysematous, but the lymphoid collections are present in about the same number, situation, and structure as in the other lung.

The *heart muscle* shows extreme brown atrophy and contains numerous scars. There are no lymphoid collections.

The prostrate, thyroid, pancreas, and bladder are not involved in the lymphadenoid disease.

REMARKS ON THE SALIVARY GLANDS.

For several reasons the condition of the salivary glands merits especial consideration. From a clinical standpoint the dry mouth in the present case attracted the greatest interest. Then in the recent paper of von Brunn[2] the relation of the symmetrical enlargement of the lachrymal and salivary glands to general lymphadenoid hyperplasia (leukemia and pseudoleukemia) is strongly emphasized.

Von Brunn classifies cases of bilateral enlargement of the salivary and lachrymal glands as follows:

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[2] Die Symmetrische Schwellung der Thränen und Mund Speicheldrüsen in ihrer Beziehung zur Pseudoleukämie. Beiträge zur Klinischen Cihurgie, Band XLV, pages 225-279.

- I.—Cases without changes in the blood.
  - A.—Without enlargement of the lymph glands and spleen.
    - a.—Symmetrical enlargement of the lachrymal and salivary glands.
    - b.—Symmetrical enlargement of the lachrymal glands alone.
    - c.—Symmetrical enlargement of the salivary glands alone.
  - B.—With enlargement of lymph glands or spleen.
    - a.—Symmetrical enlargement of the lachrymal and salivary glands.
    - b.—The same with infiltration in the skin.
- II.—Cases with changes in the blood.
  - A.—Severe anemia with lymphatic pseudoleukemia and aplasia of the bone marrow.
  - B.—Leukemia.

While one can fit into this scheme all of the cases hitherto reported, the attempt is unsatisfactory in many respects. In many of the cases the clinical interest in the salivary and lachrymal glands overshadows everything else. In some cases examinations of the blood and the superficial lymphatic glands are not mentioned. In others the blood examinations are quantitative rather than careful qualitative studies. Then what is very important, few of the observers have had in mind any relation between the symmetrical enlargement and a general disease of the lymphadenoid system. Observation over a moderately long period of time is necessary before making positive statements as to the absence of enlargement of the lymphatic glands on account of the well-known tendency to sudden enlargement and retrogression in the hyperplastic diseases of the lymphatic glands. For these reasons the scheme is rather top-heavy in that so many cases have been thrown into Class I, whereas, if in all of the cases careful physical examinations and studies of stained blood films with especial reference to relative lymphocytosis and atypical mononuclear cells were given, there are many reasons for believing that the relations would be very different.

However, the chief point to be grasped is that in practically all cases the symmetrical enlargement consists in an abundant deposit of lymphoid cells or a development *in loco* of lymphadenoid tissues, and that whether or not dry mouth ensues is due to the extent of the compression which the new tissue exerts on the secreting elements, as the changes in the glandular elements seem to be in the nature of a simple atrophy with consecutive slow degeneration and disappearance, rather than an acute primary degeneration.

In some of the cases reported as miliary tuberculosis of the salivary glands it is to be noted that animal inoculations are negative or unattempted, that organisms are not demonstrated, and caseation is not observed. It is possible, therefore, that the so-called tubercles are merely collections of lymphoid cells with germ centers. These formations are frequently observed in the chronic inflammatory swelling of the salivary glands (Steinhaus), and there is an exquisite example of such a condition in this laboratory. It was only after repeated failures to find the organism, and knowledge of the subsequent clinical course that everyone concerned was quite satisfied that the nodules were not epithelioid tubercles. On the whole it is only natural to be sceptical in these cases in which tubercle bacilli are not demonstrable, caseation is not marked, and animal innoculations are negative.

It is rather striking that when the observer had in mind the relation of pseudoleukemia to the symmetrical enlargement of the salivary glands, when careful examination of the lymphatic system was made and stained blood films were studied, the results were usually positive as regards the existence of pseudoleukemia. Consequently it is very tempting to believe that most of the cases of bilateral enlargement of the salivary glands occur in the course of a general hyperplastic disease of the lymphadenoid system. However, it will be too extreme to doubt the existence of a bilateral swelling of the glands in which the histologic picture is that of lymphadenoma, unaccompanied by a general lymphadenoid hyperplasia. The tendency to development of collections of lymphoid cells in the unilateral chronic inflammations of the salivary glands is well established and there is no reason, if irritating material be brought to the glands on both sides through the ducts, that a bilateral lymphoid tumor should not develop independently of a general lymphadenoid disease. The most tempting classification seems to me to be:

I.—Bilateral enlargement of the salivary (and lachrymal) glands in general lymphadenoid hyperplasia,
  a.—aleukemic, or,
  b.—leukemic.
II.—Bilateral enlargement of the same glands without involvement of the lymphadenoid system as a whole.

Concerning the prognosis in the cases accompanied by a general lymphadenoid hyperplasia, it must be said that it is always grave, death occurring within three years but more frequently within one or two.

LYMPHOCYTOMA IN GENERAL.

It would profit little to collect all the hitherto reported cases of the same or similar nature for a comparison with this single case, and it would be burdensome to discuss the different viewpoints held and the nomenclature used by the many investigators of this group of diseases. It has been my endeavor to express the view elsewhere,[3] that the proliferations of the lymphadenoid tissue belong in one disease family, and that there are all degrees of activity from the small, uniform cell-type of relatively benign character up to the large atypical cell forms in which invasive and destructive tendencies are marked.

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[3] *Folia haematologica*, II, Jahrgang, pages 649-657.

It is interesting, however, to examine some of the earlier cases, for there we find that several observers had reached conclusions almost fully abreast of our present knowledge of the nature and pathologic histology of these lymphoid formations, so that thirty-five years of improvement in histologic methods have not lead us any nearer to a final and generally accepted interpretation of the lymphadenoid proliferations.

Murchison's first case[4] is of striking interest, and is so rich in detail and at the same time so succinctly presented that it is difficult to do justice to it in the abstract which follows.

The patient, a male, twenty-four years of age, sought relief for pain across the abdomen, and vomiting, especially after eating. Onset eight weeks before admission. One month before the abdomen began to swell and a week afterward swelling appeared in legs. Rapid emaciation and night sweats. No diarrhea. On admission the patient was pale and emaciated. Extreme edema in both legs, great abdominal distension (34½ inches at the umbilicus), but no edema of upper part of body. Distinct evidence of fluid in a circumscribed cavity bounded superiorly by transverse colon and extending two to three inches to the left of the umbilicus. Right flank always tympanitic and the left dull on percussion, in whatever position the patient lay. No distinct tumor could be felt but there was an obscure deep-seated hardness to the right of the umbilicus. The subcutaneous veins of the abdomen were more distinct than usual but did not seem enlarged. Loss of appetite, but much thirst; bowels regular. Heart sounds normal. In the right apex and bases of both lungs dulness, harsh breath sounds, and coarse crepitation. Death three days after admission.

At autopsy there was a "large tumor in front of the spine, and covered by a mass of bowels distended with gas. This tumor consisted of a mass of greatly enlarged mesenteric glands, with an enormous thickening of the coats of the duodenum and upper part of the jejunum, apparently due to deposit in the submucous and subserous tissues. It commenced abruptly three inches below the pylorus, and the coats of the bowel all round were from an inch to two inches in thickness. At the thickest part the muscular coat could no longer be distinguished. Proceeding downwards, the amount of morbid deposit gradually diminished, but altogether the disease extended continuously over eight inches of the gut, and below this, both in the small intestine and in the colon, were several isolated plates of deposit an inch or more in diameter in the coats of the bowel, and causing corresponding elevations of the mucous membrane. On section the deposit presented a uniform greyish-white, slightly translucent character. At some places the section yielded a milky juice, but everywhere the juice contained nothing but a multitude of round nuclei of about a uniform size and closely resembling lymphatic gland-nuclei. The intestinal mucous membrane corresponding to the morbid deposit was not ulcerated, and the calibre of the gut did not appear materially narrowed." The subperitoneal tissue of the abdominal parietes, diaphragm, bladder, mesentery, postperitoneal areolar tissue contained a similar deposit. All of the mesenteric glands were enlarged. Peyer's patches and the solitary glands of the ileum were normal. Spleen not enlarged, but the Malpighian bodies were large and distinct. In the liver, kidneys and heart muscle were greyish-white nodules. There were no evidences of tuberculosis in the lungs; the upper lobe of the right lung was edematous, and the lower lobe of both lungs were "condensed from pressure."

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[4] "Case of a New Morbid Growth Composed of Nuclear Tissue, in the Intestine, Liver, Kidneys, Lymphatic Glands, Heart, and Other Organs." "Transactions of the Pathological Society of London." Volume XX, pages 192-1908.

The report of the committee on morbid growths describes the diffuse infiltration in the intestine and the nodules in the liver, kidneys, and diaphragm as being composed of "spheroidal corpuscles, which appear to be held together by transparent stroma. They vary in diameter from 1/400 to 1/200 of an inch, and resemble in every respect the lymph corpuscles which are the main constituents of leukemic growths and of a variety of morbid products." They do not, however, give it any name, as they regard it as different from any case which they have seen, or of which they have read descriptions.

In his *second case*[5] there was massive enlargement of the cervical, clavicular, axillary, and inguinal glands in a girl six years of age. The masses were tender on pressure, and distinctly nodular. The abdomen was distended, and the spleen much enlarged.

At autopsy the masses "were found to consist of a firm, greyish-white or greyish-yellow material, yielding no milky juice on section, and containing none of the cells or nuclei met with in cancer, but having the ordinary structure of enlarged lymphatic glands." Similar masses were found in the heart, lungs, diaphragm, liver, and spleen. The spleen was enlarged, weighing 13½ ounces. In the thymus region was a large mass "sending prolongations upwards to the neck, but extending mainly backward to the base of the heart, where it enveloped the great vessels, the lower end of the trachea and the roots of the lungs, and communicated with the bronchial and esophageal glands which were also enlarged. This mediastinal mass, larger than a man's fist, encroached upon the tissue of the lungs, entering it with the bronchus and great vessels, in exactly the same way as a cancerous tumor of the mediastinum." Peyer's patches and the solitary follicles were not enlarged, but the mesenteric, lumbar, and pelvic glands were much enlarged, and formed a connecting chain between the diseased inguinal glands and those in the fissure of the liver. The kidneys were free from lymphoid deposit. For this case and his previous one Doctor Murchison adopts the designation *lymphadenoma* which he ascribes to Ranvier and Cornil.

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[5] "Case of 'Lymphadenoma' of the Lymphatic System, Spleen, Liver, Lungs, Heart, Diaphragm, Dura Mater, et cetera." "Transactions of the Pathological Society of London." Volume XXI, pages 372-389.

Doctor Sanderson reports on the histologic characters of the growths that they consist of collections of small leukocytes imbedded in a dense stroma. He compares the structure with that of an indurated lymph gland. In the liver the cell collections surround the portal tracts, and in the lungs they are situated in the peribronchial connective tissue. In his opinion this case differs from the first one only in the relative number of corpuscles in the growths, the stroma being much more abundant in the second case. By a curious coincidence there appear, in the same volume of the "Pathological Transactions," reports of three cases of a similar or identical nature (Powell, Tuckwell, and Dickenson).

Under the name of *desmoid carcinoma* R. Schulz[6] reports seven cases which would now be designated as lymphosarcoma or lymphocytoma. The distribution of the lesions varied considerably in the several cases. In some cases the cervical, in others the mesenteric and retroperitoneal glands and the stomach or intestine were the seat of the most prominent lesions. In most cases there were lymphoid masses from the size of a pinhead up to that of a cherry in the kidneys, liver, and spleen. In his fourth case, in which the cervical and inguinal glands were greatly enlarged, the parotid glands were also enlarged, and upon microscopic examination the glandular tissue was found to be replaced by a lymphadenoid structure. The histology of the lymph glands is as follows: The distinction between follicle and sinus is entirely lost. The gland is represented by a uniform mass of cells in an extremely delicate reticulum. The nuclei of the cells measure 3-6-10 microns. The connective tissue fibrils of the capsule and trabeculæ are separated by groups and cords of white cells. The surrounding fat tissue is likewise invaded. The mass of lymphoid cells contains very numerous blood-vessels with thin walls.

His views on the nature of the lesions (excluding the unfortunate term "desmoid carcinoma") and their method of development are especially valuable, as he was one of the first writers to state clearly the doctrine of a multiple autochthonus proliferation. In desmoid carcinoma, he says "we have to do with a general disease of the lymphatic system caused by a virus, as is assumed by W. Muller, who believes also in the presence of such a virus in epithelial carcinoma. We do not know the nature of this virus, but it resembles the syphilitic virus in producing an atypical growth of the connective tissue elements throughout the body. This hypothesis is apparently justified by the fact that groups of lymph glands in the various regions of the body are affected simultaneously or within a relatively short space of time. The spleen and occasionally the bone marrow are involved. We have then the chief bloodforming organs diseased without any demonstrable cause. Furthermore, where metastases occur in the later course of the disease, they do not arise from transported cells as in epithelial carcinoma but from connective tissue cells *in loco*, which are stimulated by the virus circulating in the lymph. Generally, in all of the organs the new tissue follows the course of the blood-vessels, and, indeed, appears to spring from the walls of the perivascular lymph-vessels."

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[6] "Klinisch-anatomische Betrachtung über das 'Desmoidcarcinom'," *Archiv der Heilkunde*, 15er Jahrgang, pages 193-238.

In regard to the relation of this desmoid carcinoma to leukemia, he makes some interesting remarks. He questions if leukemia itself is not a desmoid carcinoma, in fact, a chronic one. On account of the slow course of leukemia it is possible for the newly-formed white cells to enter the circulating blood, while in the disease which he describes as desmoid carcinoma the cells are produced in such masses in so short a space of time that they occlude the efferent lymph channels, and then it becomes impossible for them to force their way into the blood stream. Of course, this explanation of the difference between leukemia and pseudoleukemia cannot hold in the light of our knowledge of the course and pathology of acute leukemia. Nevertheless, in the main, his views on the correlation of the two conditions do not suffer by comparison with some of our recent conceptions on the nature of the lymphadenoid proliferations. It is expressly stated in the reports of Murchison's and Schulz's cases that there was no increase in the white cells in the blood.

Similar cases might be mentioned almost *ad infinitum*, but I will mention only two American contributions, those of Flexner[7] and Libman.[8] Cases which bridge the gap between the aleukemic and leukemic lymphomatous conditions are of especial interest, and to this class belongs the case reported by Doctor Warthin.[9] In this case the anatomical picture was that of intestinal lymphosarcomatosis, while the blood picture corresponded to a mixed-cell lekuemia.

SUMMARY.

The case in hand corresponds with many cases reported as pseudoleukemia, lymphadenoma, and lymphosarcomatosis. The reasons which Ribbert has advanced for the designation *Lymphocytoma* are especially applicable here, and this is selected as the most expressive histologic term. The general features of lymphocytoma are its origin in the lymphatic system and the strict limitation of the process to tissues in which there are preexisting lymphatic structures, the *characteristic and predominant elements of the tumor being lymphocytes.* The lymphocytes may be mature, having as their prototype the small lymphocyte of the circulating blood, or they may be large with pale vesicular nuclei and correspond with the cells in the germ centers. The small blood-vessels, the endothelial cells, eosinophiles, and multinucleated cells are to be regarded as accompaniments rather than essential parts of the tumor formation. Although a definite stroma is always present, the moderate or excessive production of fibrous tissue follows the same unknown rules that obtain in carcinoma, leading to soft or hard tumors. The use of the term lymphocytoma implies an acceptance of the doctrine of the unity of the lymphadenoid tumor formations, and brings lymphoma, myeloma, and chloroma into the closest possible connection with leukemia. In lymphatic leukemia the foreign elements approach the lymphocyte type, while in myeloid leukemia the elements have their prototype in the myelocytes or their progenitors. The entrance of the foreign cells into the blood stream (that is, leukemia) in lymphocytoma, myeloma, and chloroma is governed by rules which are wholly beyond our grasp, although Türk, Pappenheim, and Ribbert have advanced very attractive speculations. So much has been written in support of these contentions that it will suffice to point out here that, on one hand, there are thoroughly reliable reports of lymphocytoma and myeloma (MacCallum) without any invasion of the blood stream by the foreign cells demonstrable by study of stained blood films, and that, on the other, in typical and atypical leukemia the infiltrations and tumor masses are histologically indistinguishable from lymphocytoma (including under this head pseudoleukemia, lymphoma, and lymphosarcomatosis).

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[7] "Multiple Lympho-sarcomata, with a Report of Two Cases," *The John Hopkins Reports*, 1894, pages 155-193.

[8] "Sarcoma of the Small Intestine," *American Journal of the Medical Sciences*, Volume CXX, pages 309-327.

[9] "The Neoplasm Theory of Leukemia," "Transactions of the Association of American Physicans," 1904, and the *Medical News*, 1904.

In lymphocytoma invasion of contiguous structures is always present, consequently, the tumors are in the strictest sense malignant; yet this invasion is sometimes very slight and leads one to regard the tumor as relatively benign. There are certainly all degrees from a slight infiltration of a gland capsule or the muscular coats of the gastro-intestinal tracts, visible only on microscopic examination, up to the massive infiltrating and ulcerating growths in the mesenteric glands and intestines.

Now as to the interpretation of the multiple masses found scattered throughout the different viscera and tissues, we have the opposing views of metastasis and a multiple independent autochthonus origin. From the facts that they occur only where there have been preexisting lymphoid structures, that there is apparently no increase in the absolute or relative number of the lymphocytes in the circulating blood, and that the cells do not depart from the normal type, the impression gained is that the almost ubiquitous lymphoid collections are the result of an independent and possibly nearly simultaneous or closely consecutive proliferation of the lymphatic system as a whole. Here it is easily seen that we are on the border-line between hyperplasia and tumor formation. The histologic picture of a superficial lymph node and the parotid gland differs but little from the chronic inflammatory hyperplasia encountered in these structures. Likewise, collections in the kidneys, in the thickened pleura, and in the atelectatic lung are found in chronic inflammations with the same localization, independent of general lymphadenoid hyperplasia. Furthermore it is difficult to conceive of an universal lymphogenous metastasis without invasion of the blood stream through the thoracic duct.

The summary of this case of an old disease under a comparatively new name may point out features which will aid one in formulating a diagnosis during life of this not infrequent affection. We have an obscure abdominal tumor mass with ascites and edema of the lower extremities, achylia, diarrhea, symmetrical enlargement of the salivary glands with dry mouth, and slight enlargement of the superficial lymphatic glands without leukemia, enlargement of the spleen, fever, or signs of tuberculosis in the lungs. The diagnosis of the intestinal condition was, as in Murchison's case, tuberculosis or carcinoma. With our present knowledge of the relation of the bilateral salivary enlargements to leukemia and pseudoleukemia one would be tempted to infer that the intestinal condition was a part of the "pseudoleukemia" (lymphocytoma), but as this combination of abdominal and salivary tumors is exceedingly rare one must look for further details of the intestinal condition in order to exclude carcinoma or tuberculosis. There is almost never constipation and frequently there is diarrhea, and this rests upon the anatomical fact that the intestinal wall at the seat of involvement is dilated and sac-like instead of constricted as in carcinoma and hyperplastic tuberculosis. The ascites develops before edema of the lower extremities sets in, and the possible explanation of this is that the peritoneum reacts quickly to the foreign masses while they must attain large dimensions before they can compress the vena cava to such a degree as to produce edema below. Anatomically our case presented a large tumor mass of mesenteric glands in a board-like mesentery, a sacular dilatation of the ileum presenting features of lymphadenoid involvement, parotid tumors, consisting almost wholly of lymphadenoid material, moderate general enlargement of the remaining lymphatic glands, miliary lymphoid nodules in the lungs, liver, spleen, kidneys, and adrenals, and infiltration of the omental villosities but no splenic tumor. Histologically the tumor mass, the salivary glands, lymphatic glands, and the multiple miliary new formations present the same picture:—a vascular lymphadenoid tissue in which mature lymphocytes are the predominant cells.

AN EXPERIMENTAL STUDY OF EFFECTS OF ROENTGEN RAYS UPON THE BLOOD-FORMING ORGANS, WITH SPECIAL REFERENCE TO THE TREATMENT OF LEUKEMIA.

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[CONTINUED FROM PAGE 12.]

PART II.—EXPERIMENTAL.

THE protocols of all the animals experimented upon would make this paper too bulky if they were included. It has, therefore been thought wise to select a typical series of experiments to be given in detail, the others to be referred to in a general or collective manner.

SPLEEN.

Technic.—The animals used for experimentation were either killed by chloroform or watched until death took place, and the organs removed from the body while warm and fixed at once in a saturated solution of mercuric chloride. In those cases in which the animal was not seen at the time of death 4 per cent formaldehyde solution was used for the fixation. Flemming's solution was also used as a fixing agent. All of the material with the exception of that fixed in Flemming's was imbedded in paraffin. The ordinary stains were used, chiefly hematoxylin and eosin. The Flemming's material was imbedded in celloidin. Smears were made from the cut surface of the spleen in nearly every case. These were fixed in equal parts of absolute alcohol and ether, and stained in hematoxylin and eosin.

EXPERIMENT I.

WHITE MOUSE 1.—Exposed one-half hour (alternate exposures of two minutes and shutting-off of current for two minutes for one hour, total length of actual exposure thirty minutes). Tube, medium soft. E.M.F.-four-inch spark gap for current used about 3 milliamperes. Tube excited to its limit. Penetration four millimeters aluminum. Tube distance eight inches. The animal showed no effects from the exposure. Was killed at once by chloroform. Autopsy appearances negative. Spleen of normal size and color. *Microscopy.*—With low power, nothing pathologic could be seen. With higher power (Number 7, Leitz) lymphocytes showing nuclear fragmentation could be seen all through the pulp. Similar lymphocytes with nuclei showing karyorrhexis were present also in the follicles but to a less number than in the pulp. In many lymphocytes the nucleus appeared swollen and vacuolated, the chromatin being clumped into small deeply-stained spherules or granules. Few mitotic figures were seen and these showed some disarrangement of the chromosomes. The polymorphonuclear leukocytes were swollen and the nuclei vacuolated and more faintly

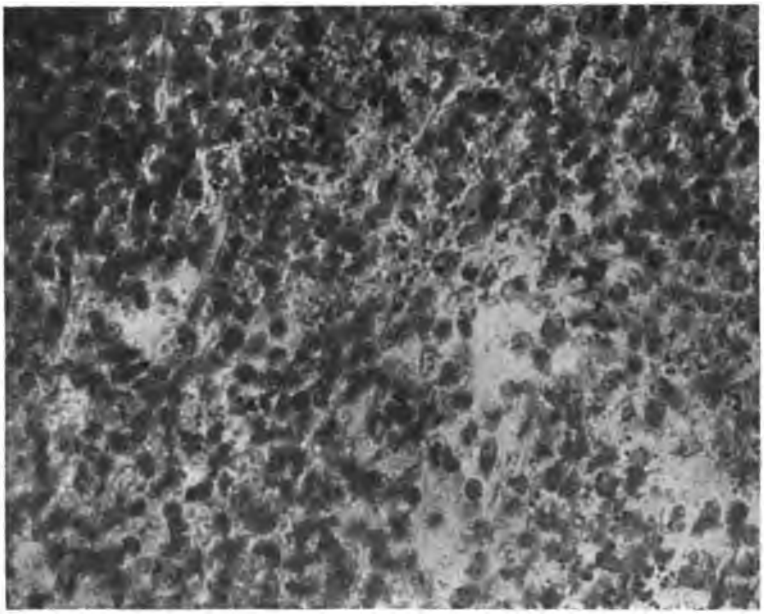

Figure I.—Splenic Pulp of a white rat exposed to the Röntgen rays for thirty minutes; killed six hours after exposure; shows disintegration of lymphoid cells.

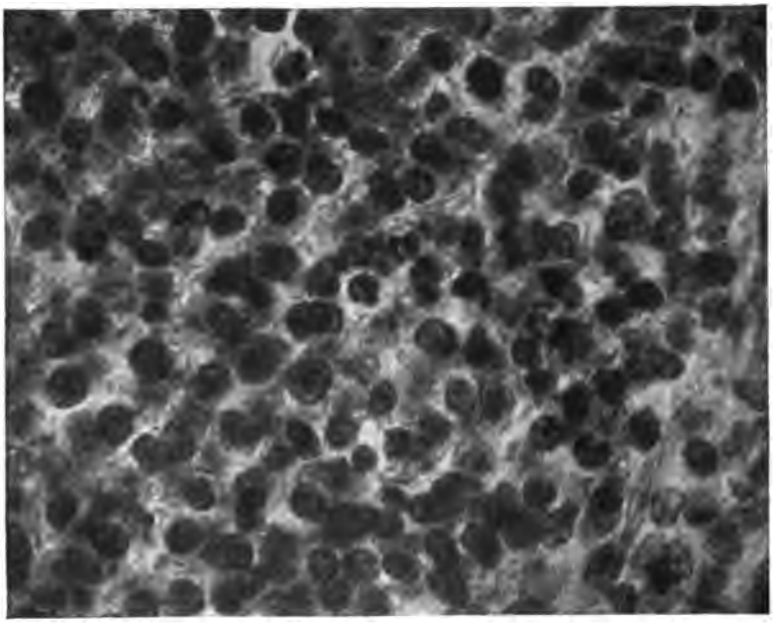

Figure II.—Splenic pulp of a mouse exposed to the Röntgen rays for thirty minutes; killed one hour later; shows disintegration of the lymphocytes.

staining than normal. No changes were noted in the giant cells, and cells with granulation of their protoplasm were not found, either in the sections or in the smears. The smears were characterized by the presence of great numbers of cells of the large lymphocytic type having very pale nuclei, many of which contained large or small vacuoles. Numerous chromatin spherules or granules were present also, as well as many polymorphonuclear cells showing nuclear fragmentation.

MOUSE 2.—Exposed under exactly similar conditions as Mouse 1. Killed by chloroform one-half hour after exposure. Autopsy showed a small and pale spleen. Other appearances negative. *Microscopy.* —With the low power groups of deeply staining chromatin granules and spherules could be seen through the pulp and in the follicles, but they were more numerous in the former. The blood-spaces were somewhat smaller than normal, and the total number of lymphoid cells seemed diminished. Numerous small and large lymphocytes showed an apparent liquefaction of the nucleus, as shown by very faint staining and vacuolation, the cell-body itself appearing swollen as if hydropic. The nuclei of some of the giant-cells presented a peculiar coarse granulation and stained less deeply. The smears showed an increased number of cells with fragmented and pyknotic nuclei. All transition-stages of such fragmentation were present.

MOUSE 3.—Exposed under exactly similar conditions as the above. Apparently not affected. Was killed by chloroform one hour after the exposure. The autopsy showed a small pale spleen, firm and dry. No other changes found. *Microscopy.*—The changes were similar to those found in Mouse 2, but the number of fragmented lymphocytes was greater, and with the low power numerous clumps of chromatin granules could be seen all through the pulp and follicles. The follicles were small and contained fewer cells, but stood out distinctly because of the diminution in number of the lymphoid elements of the pulp. No mitotic figures were seen. Numerous yellowish pigment granules were present throughout the pulp, for the greater part contained in endothelial phagocytes. The giant-cells showed some evidences of degeneration. The polymorphonuclear leukocytes were few in number. The smears showed numerous cells with vacuolated and fragmenting nuclei.

MOUSE 4.—Exposed under same conditions as above. Apparently not affected. Was killed by chloroform one and a half hours after the exposure. Spleen enlarged and dark red. *Microscopy.*—Blood-spaces of spleen dilated. Throughout the pulp there were numerous fragments of chromatin staining dark blue, almost black. These granules were irregular in size; in some areas they were very small—"chromatin dust"—while in other parts they were of larger size. With the low power they at once attracted attention in the case of the follicles, the groups of dark chromatin standing out in sharp contrast against the lighter background of the follicle. The number of lymphoid cells in both follicles and pulp appeared diminished. Some of the

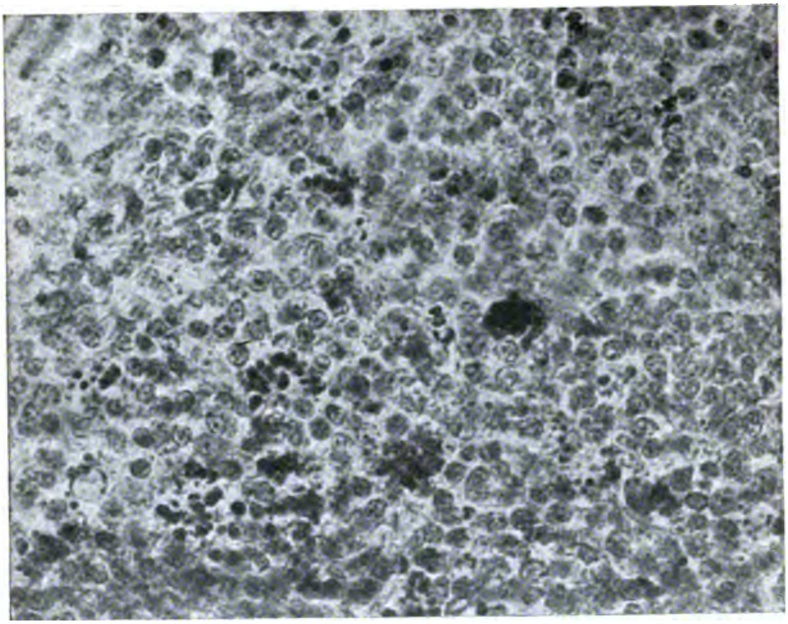

Figure IV.—Splenic pulp of a white mouse exposed to the *x*-rays two hours; killed at once; shows groups of disintegrating lymphocytes.

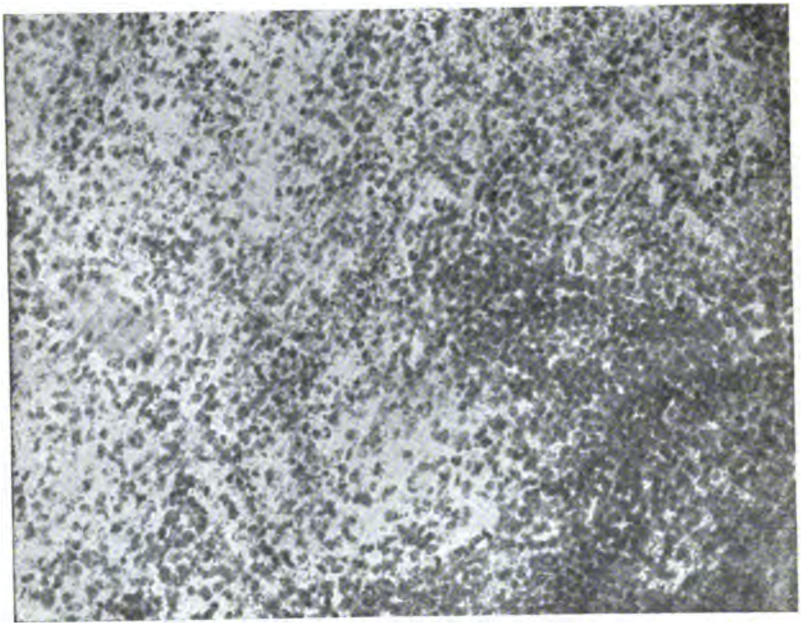

Figure III.—Splenic pulp of white rat exposed to the *x*-ray thirty minutes; killed five hours later; shows disintegration of nuceli (low power).

giant-cells showed disintegrating nuclei. Numerous pigment granules were present. The smears were practically the same as those of Mouse 3.

MOUSE 5.—Exposed under the same conditions as above. Apparently not affected. Was killed by chloroform two hours after the exposure. Spleen larger than normal, dark red. *Microscopy.*—Practically the same microscopic picture as in Mouse 4.

MOUSE 6.—Exposed under the same conditions as above. Apparently not affected. Was killed by chloroform two and a half hours after. Spleen smaller than normal, pale red, dry. *Microscopy.*—The blood-spaces were collapsed. The number of lymphoid cells in the pulp and follicles was apparently much less than normal. The loss of cells was particularly evident in the pulp. Numerous clumps of disintegrated nuclei and also vacuolated nuclei were present throughout the pulp and the follicles, being especially prominent in the latter location. Numerous yellowish-brown pigment granules (hemosiderin) were scattered throughout the pulp, for the greater part in endothelial phagocytes.

MOUSE 7.—Exposed under exactly the same conditions as above. The animal was apparently not affected. Killed by chloroform three hours and twenty minutes after the exposure. Spleen red, slightly enlarged. *Microscopy.*—The microscopic picture was similar in all respects to that of Mouse 6. The blood-spaces were somewhat dilated.

MOUSE 8.—Exposed under exactly the same conditions as above. Apparently not affected. Was killed by chloroform four hours afterward. Spleen slightly enlarged. *Microscopy.*—Picture was similar to that of Mouse 6, perhaps some more disintegration of nuclei, the clumps of chromatin granules standing out sharply in the lighter background of the pulp and follicles. The total number of lymphoid cells was apparently much diminished. No mitoses were seen. Numerous pigment granules were seen in the pulp.

MOUSE 9.—Exposed under the same conditions as the above. Animal more quiet than normal. Eyesight apparently impaired. Back humped. Was killed by chloroform five hours after exposure. Spleen somewhat swollen, brownish red. *Microscopy.*—Numerous clumps of chromatin granules apparently in large phagocytes occurred throughout the pulp and follicles, but were more numerous and prominent in the latter. There were numerous pigment granules. The lymphoid cells of the pulp were diminished in number, but also to a very noticeable extent in the follicles. The follicles were smaller than normal, but stood out very distinctly against the lighter background of the pulp. The giant-cells were numerous; some showed vacuolation and nuclear fragmentation. No mitoses were seen.

MOUSE 10.—Exposed under exactly the same conditions as the above. Animal more quiet, back humped, and eyesight apparently impaired. Was killed by chloroform six hours later. The spleen was

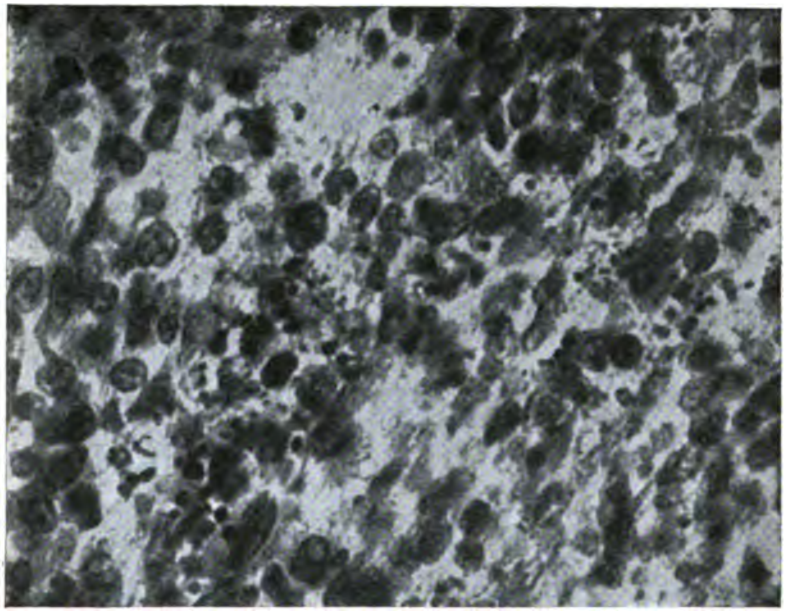

Figure VI.—Splenic pulp of a rabbit eight hours after two hours' exposure to the x-rays; shows marked nuclear disintegration.

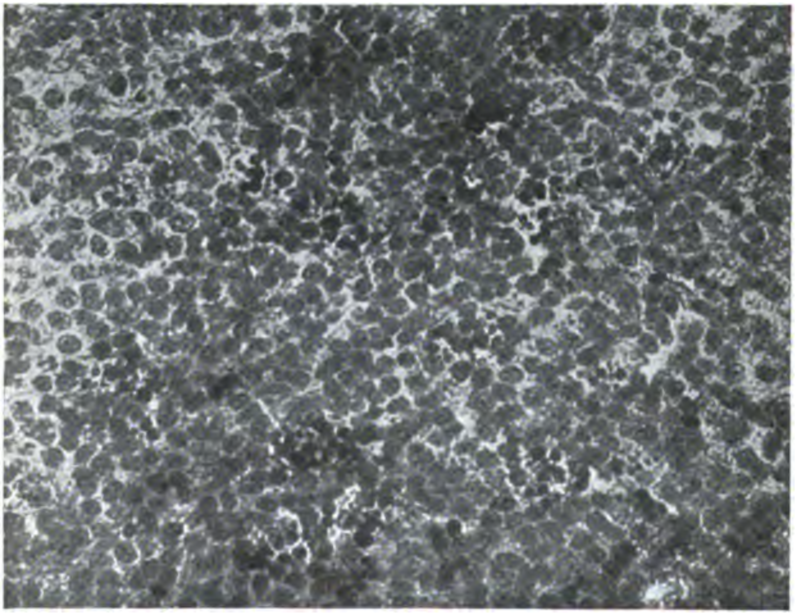

Figure V.—Splenic Pulp of a white mouse exposed to the x-rays thirty minutes; killed in one hour; shows groups of disintegrating cell and clumps of chromatin contained in phagocytes.

small, and brown-red in color. *Microscopy.*—The picture was much the same as in Mouse 9. The number of phagocytes was probably greater here, and these seemed to have collected in the blood-spaces of the follicles. For that reason the follicles as seen with the low-power presented a striking appearance; against the lightly-staining background of nearly every follicle the clumps of deeply-staining chromatin spherules and granules stood out very prominently, few lymphoid cells of normal appearance were seen in the follicles. Numerous cells with disintegrating nuclei and vacuolation were still present throughout the pulp. No mitoses were found.

MOUSE 11.—Exposed under exactly the same conditions. Animal quiet, back humped when running, eyesight impaired. Was killed by chloroform seven hours after the exposure. Autopsy showed spleen to be smaller and browner than normal. *Microscopy.*—Blood-spaces of spleen collapsed. The number of lymphoid cells in pulp and follicles diminished. The reticulum was more prominent. In the follicles there were numerous groups of phagocytes containing deeply-staining chromatin granules of irregular size. The centers of many follicles were light and consisted of large pale-staining epithelioid cells. Some of these showed degeneration, as evidenced by the granular character of their protoplasm and by vacuoles. The giant-cells were also apparently diminished in number. Fewer vacuolated cells were found throughout pulp, but single disintegrating cells were still common. No mitoses found.

MOUSE 12.—Exposed under exactly similar conditions as above. Same effects upon animal. Killed by chloroform eight hours after exposure. Spleen slightly diminished in size, and brownish red. The other organs apparently negative. *Microscopy.*—The microscopic appearances were similar to those of Mouse 11.

MOUSE 13.—Exposed under exactly similar conditions. Same effects. Killed by chloroform fifteen hours later. Spleen about normal in size and brownish-red in color. Other organs apparently normal. *Microscopy.*—Numerous phagocytes containing chromatin granules were still present in the lightly-staining follicles and pulp. Single cells with disintegrating nuclei were still present throughout the pulp, but were probably somewhat fewer in number than in Mouse 12. Vacuolated nuclei were also fewer. The reticulum was more prominent. The giant-cells were also apparently diminished in number. Many pigment granules were present in endothelial phagocytes throughout the pulp and blood-spaces. No mitoses were found.

MOUSE 14.—Exposed under exactly the same conditions as the above. Same effect. Was killed by chloroform twenty-four hours after exposure. *Microscopy.*—Phagocytes containing deeply-staining chromatin granules were still present in the follicles and pulp but more numerous in the former. Single cells with disintegrating and vacuolated nuclei were also found throughout the pulp, but were not so

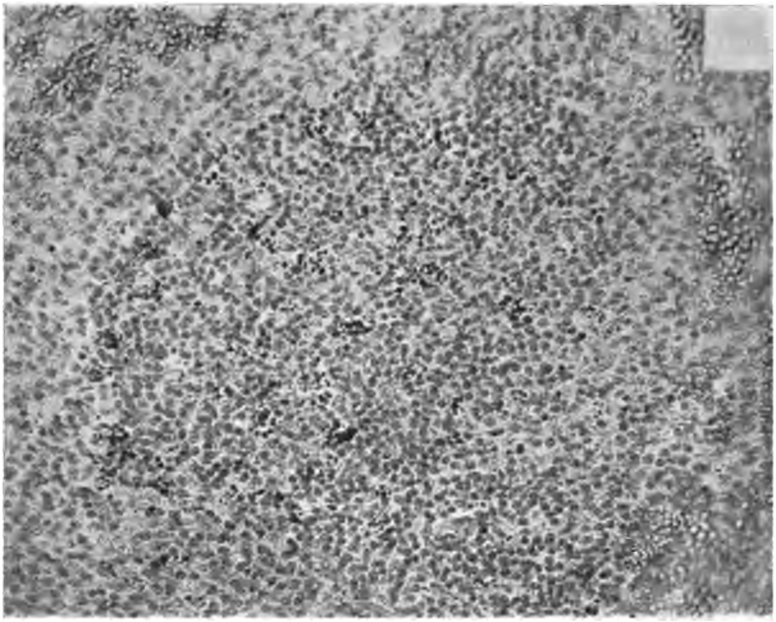

Figure VIII.—Splenic follicle of a rabbit eight hours after thirty minutes' exposure to the *x*-rays; shows phagocytes filled with chromatin granules.

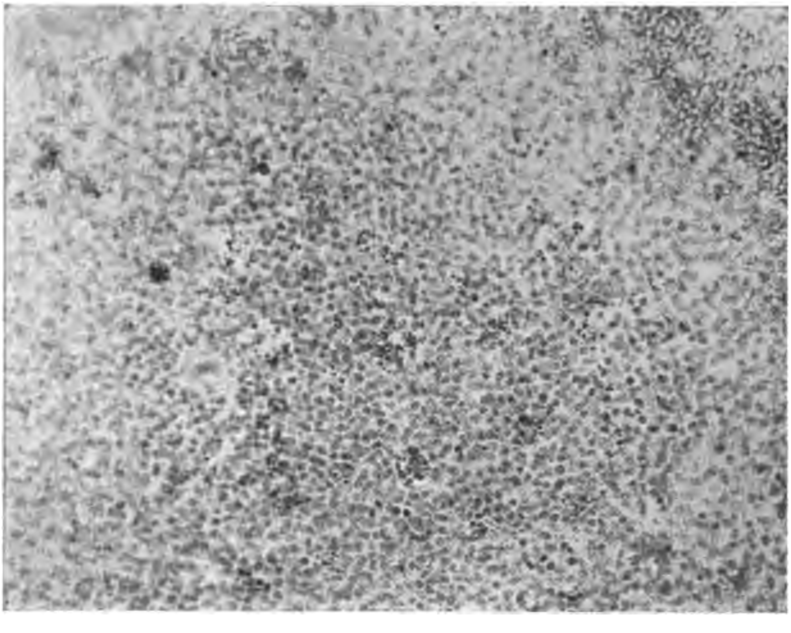

Figure VII.—Splenic follicle of a white mouse six hours after thirty minutes exposure to the *x*-rays; shows collection of disintegrated lymphocytes in phagocytes.

numerous as in Mouse 12. The number of lymphoid cells throughout pulp and follicles was apparently greatly diminished. Few leukocytes were in the blood-vessels. The follicles were small and had light centers of large epithelioid cells. Numerous pigmented cells were found throughout the pulp spaces. No mitoses were found.

EXPERIMENT II.

Full-grown white mouse. Exposed thirty minutes (consecutively). Hard tube, six inches distance. No apparent effects upon the animal. Was killed by chloroform twelve hours after the exposure. Spleen small, light in color, dry. *Microscopy.*—Numerous fragmenting nuclei were present in the follicles and pulp, but much more abundant in the former. The chromatin granules were of irregular size, usually spherical, and stained very deeply, almost black. All stages of nuclear disintegration in the lymphocytes could be traced. Many of them had swollen and vacuolated nuclei; in others the nuclei appeared as if being dissolved, the cell-body clear and the nuclei broken up into very small granules which took the nuclear stain very faintly or in part stained with eosin. The centers of the follicles were light and in many were made up of large faintly-staining epithelioid cells. Few mitoses were seen and in these the chromosomes appeared somewhat clumped. Very few pigment granules were found. The giant-cells were numerous; some were apparently undergoing disintegration. On the whole the most striking change was the nuclear disintegration of the lymphocytes, and the presence of the clumps of chromatin granules in the follicles. The smears showed numerous cells with pale nuclei. They appeared to be of the large lymphocyte type. Many of them showed extreme vacuolation of the nucleus. The changes in the follicles were by no means uniform, some showing a diffusely-scattered chromatin dust, others the groups of chromatin granules mentioned above, others still showing a pink-staining granular substance between the cells without much evidence of karyorrhexis.

EXPERIMENT III.

Young white mouse. Exposed five hours, medium tube, six amperes through primary of coil, tube backed, four-inch parallel spark gap. About 2 milliamperes through tube. Penetration equal to sixteen millimeters of aluminum. Mouse apparently very ill immediately after the exposure, blind, back humped, body damp and cold, shivering, paresis of hind quarters. Became comatose, died very slowly, dead within twelve hours. Body very dry, blood coagulating at once, decided brown tint. Spleen very small, deep-red. Intestines distended, filled with fluid, kidneys deep brown, smaller than normal. *Microscopy.*—The pulp was nearly devoid of lymphoid cells, consisting of blood-spaces and reticulum with occasional cells of lymphocyte type, the majority of these having granular or vacuolated nuclei. The majority

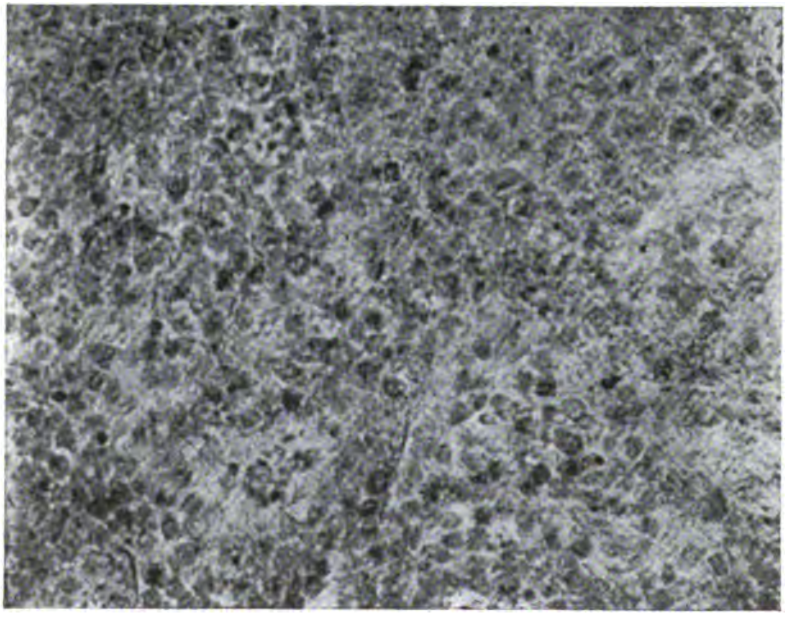

Figure IX.—Splenic pulp of a white rat killed immediately after exposure to the *x*-rays; shows beginning vacuolation and karyorrhexis.

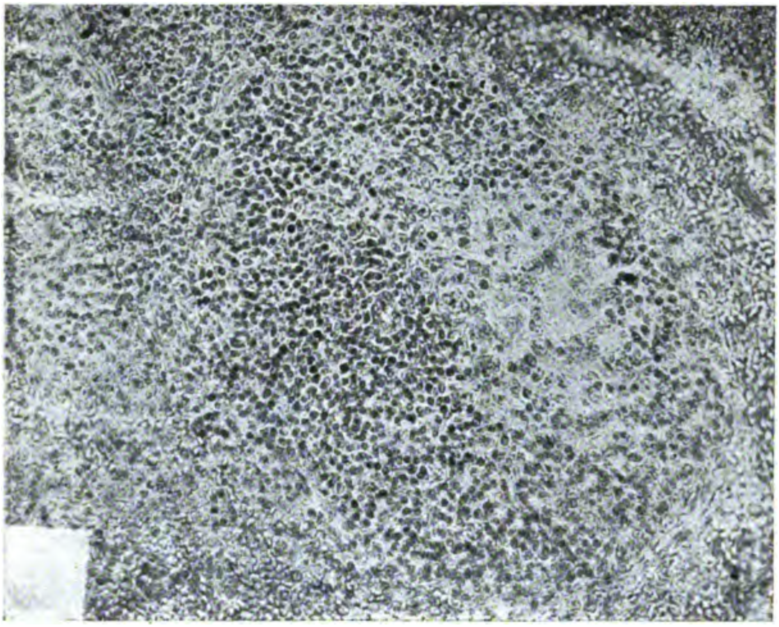

Figure X.—Splenic follicle of a rabbit twenty-four hours after exposure to the *x*-rays for one hour; shows disappearance of lymphoid cells in a portion of the follicle.

of follicles were represented by small whorls of cells of fibroblastic or epithelioid type. They contained practically no lymphocytes. In others there were numerous large clear cells with large vacuoles and small pink-staining granules, apparently a fatty degeneration, though osmic acid gave but little reaction. Transition-stages exist giving the impression that these were the remains of phagocytes which contained chromatin granules. In some many of the granules still gave a feeble reaction with nuclear stains. Vacuoles, apparently of fat, were also found in large numbers in the epithelioid cells of the follicles. In a few follicles disintegrating lymphocytes were still present, and the clumps of chromatin granules resembled those in the cases described above. Few giant-cells were present, and these for the greater part showed no change, others had vacuolated nuclei. The nuclei of the stroma cells were more granular than normal and many showed evidences of disintegration. Throughout the pulp nuclear remains could be found in the form of little groups of chromatin granules and spherules. There was no increase of blood-pigment. No mitoses or evidences of an attempt at regeneration could be found.

EXPERIMENT IV.

Half-grown white mouse exposed under exactly the same conditions as in Experiment III. At the end of the five hours exposure it had the appearance of being very ill, back humped, blind, eye closed, body damp and cold, shivering, apparently very weak, developed diarrhea, paresis of hind quarters, comatose condition, dying of slowly progressive weakness in twenty-four hours. Spleen small, dark-red, intestines distended, filled with fluid, kidneys small and dark brown in color, liver pale. *Microscopy.*—Spleen pulp was nearly devoid of lymphocytes, consisting of blood-spaces and reticulum only, in the meshes of the latter only occasional lymphocytes. Numerous disintegrating nuclei were still present as shown by little groups of chromatin granules. There were practically no leukocytes in the blood-vessels, either of the spleen or other organs. The splenic follicles were represented by fibroblastic or epithelioid whorls arranged about the arterioles. Many of these whorls contained no lymphocytes, in others deeply-staining lymphocytes were present in little groups. Some of these also showed chromatin disintegration. No mitoses were found. The giant-cells were fairly numerous, and some of these showed vacuolation. There was no increase of blood-pigment.

EXPERIMENT V.

Young gray mouse. Exposed under exactly the same conditions as in Experiment III. At the end of the five hours appeared very ill. Similarly affected. Died of paresis and a slowly developing comatose condition in forty hours. Spleen very small, dark red, intestines distended, kidneys very brown, liver pale. *Microscopy.*—The spleen

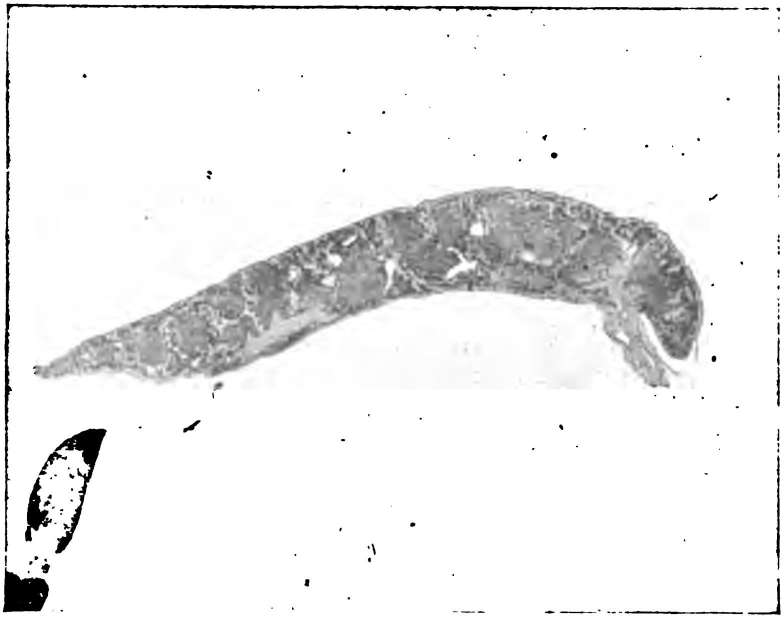

Figure XI.—Spleen of a mouse exposed thirty-two hours and fifty-five minutes (low power).

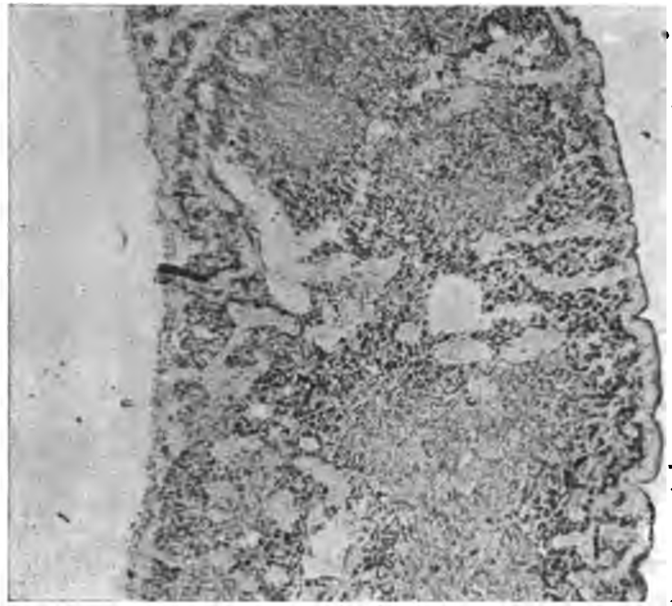

Figure XII.—Spleen of a mouse exposed thirty-two hours and fifty-five minutes (same case as Figure XI); shows complete withdrawal or destruction of lymphoid cells and excessive pigmentation (high power).

showed the same condition as in Experiment III. Pulp and follicles nearly devoid of lymphoid cells, but showing scattered fragments of nuclei. Follicles represented by epithelioid whorls nearly destitute of lymphocytes. No mitoses found.

EXPERIMENT VI.

Full-grown white mouse. Exposed five hours under exactly the same conditions as in Experiment III. Affected to a less degree, but developed more slowly the same symptoms of blindness, humped back position, weakness, et cetera. Was fairly active for two days and died on the third day of slowly progressive paralysis and coma. Spleen very small, dark red; liver pale; kidneys small and very brown, intestines dilated. *Microscopy.*—The spleen showed the same condition as in Experiment III. The pulp and follicles were nearly devoid of lymphocytes. The follicles were represented by epithelioid whorls, many of them showing no lymphoid elements, others showing some deeply-staining lymphocytes with nuclear disintegration. Some of the epithelioid cells showed vacuolation. There were few giant-cells. The pigment was not increased. Remains of nuclear disintegration were present both in the pulp and in some of the follicles, but were not abundant. In some of the follicles pigment was present in small granules. No mitoses were seen.

EXPERIMENT VII.

Full-grown white mouse. Exposed as follows: February 23, one hour and thirty minutes, medium tube; February 24, one hour and fifty minutes to same tube; February 25, seven hours to medium tube, induction coil, six-inch spark; February 26, ten hours with static machine, three-inch spark gap; February 27, eight hours with same; March 1, four hours and thirty-five minutes to same. Died while being exposed. Total length of exposure thirty-two hours and fifty-five minutes. Toward the last had shown the same symptoms as described above, and died in the same way. Autopsy: intestines greatly distended, peritoneum very dry, bladder empty, liver small and brown, spleen very small (about one-third or one-half normal size), very brown in color, firm, capsule wrinkled. *Microscopy.*—The pulp and follicles were absolutely devoid of lymphoid cells or leukocytes. The follicles were represented by large whorls of epithelioid cells having lightly staining nuclei, and grouped around an eccentrically placed arteriole. These whorls were much larger than normal splenic follicles in the mouse, and conveyed the impression of a fibroblastic or endothelial proliferation, or of greatly swollen stroma. The organ on the whole was greatly contracted, the capsule being thrown into folds and the follicles and trabeculæ being brought together. Between the follicles the pulp consisted of blood-spaces nearly obliterated by cells of the same type as those in the follicles, an apparent proliferation of the

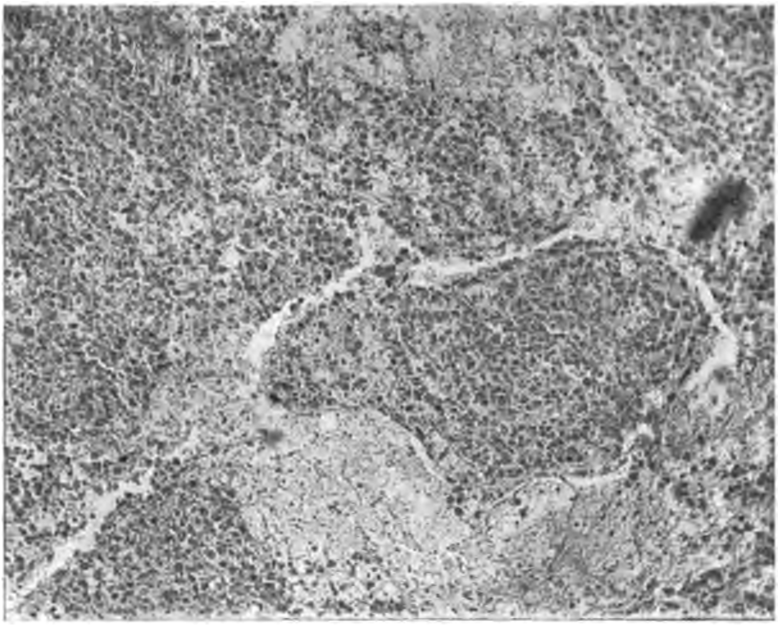

Figure XIII.—Human lymph gland after repeated exposures to the x-rays; shows areas of fatty degeneration.

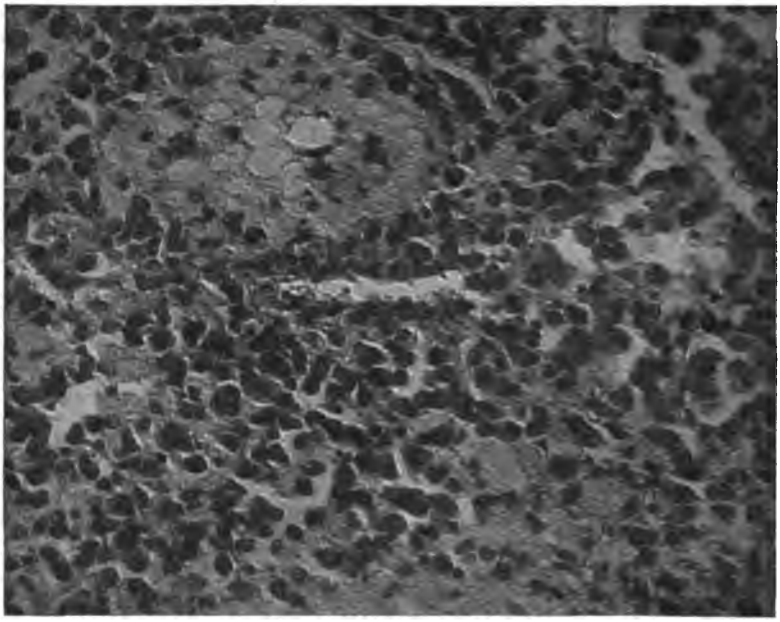

Figure XIV.—Human lymph gland after repeated (nineteen) exposures of ten minutes each; shows fatty degeneration and necrosis.

reticulum or endothelium. Outlining each lobule was a heavily pigmented area, the pigment being contained in large phagocytes, so full of pigment that the nucleus usually could not be seen. The pigment was yellowish-brown and gave the iron reaction. No giant-cells were to be seen, and practically no cells that could be regarded as lymphocytes. There were no white cells in the blood-vessels. In some of the latter the endothelium was swollen, and the lumen contracted. No evidence of active cell-disintegration, such as chromatin fragmentation or vacuolation, could be found. The great excess of pigment conveyed the impression of a very marked hemolysis. No mitoses were present, and there was nothing to suggest a lymphoid regeneration. The appearances were those of a spleen completely deprived of lymphoid and leukocytic elements, and its white-cell forming function exhausted. The smaller blood-spaces were obliterated by fibroblastic or endothelial cells, so that some areas consisted of solid masses of epithelioid cells outlined by trabeculæ of brown pigment. The connective-tissue of the trabeculæ appeared swollen and the nuclei fewer than normal. The proliferation of the cells of the stroma in the follicles and pulp must be regarded as secondary to the destruction of the lymphoid tissue.

EXPERIMENTS VIII TO XXXVII.

Series of experiments were carried out with white rats, rabbits, Belgian hares, and guinea-pigs, with brief and prolonged exposures. Details are omitted here because of the limitations of space. Results summarized as follows:

SUMMARY.—The above experiments show that the Roentgen rays have a marked effect upon the lymphoid tissue of the spleen, even when there is but one exposure and that one brief. All exposures of five hours or more caused death, usually in from two to five days; in all cases before the eleventh day. In all the exposed animals the microscopic changes showed a disintegration and destruction of the lymphoid elements of the splenic pulp and follicles as well as a degeneration of phagocytes, giant-cells and the epithelioid cells of the follicles. In all the animals studied the effects lasted for some time, and were not immediately followed by regeneration. The effect depended upon the animal exposed, its species and its individual factor, sex, character and time of the exposure. White rats appeared to be especially susceptible. Exposure of five or more hours caused the greatest destruction of lymphocytes in the spleen, and regeneration was not manifest even when the animal lived ten days after the exposure. All animals so exposed showed marked signs of general disturbance (intoxication?). A hemolytic action was also shown by the great increase of blood-pigment, but this may be due in part to disturbances of splenic function. The fatty degeneration of the lymphoid tissues is worthy of note. The disintegration of the chromatin of the lymphocytes was seen within

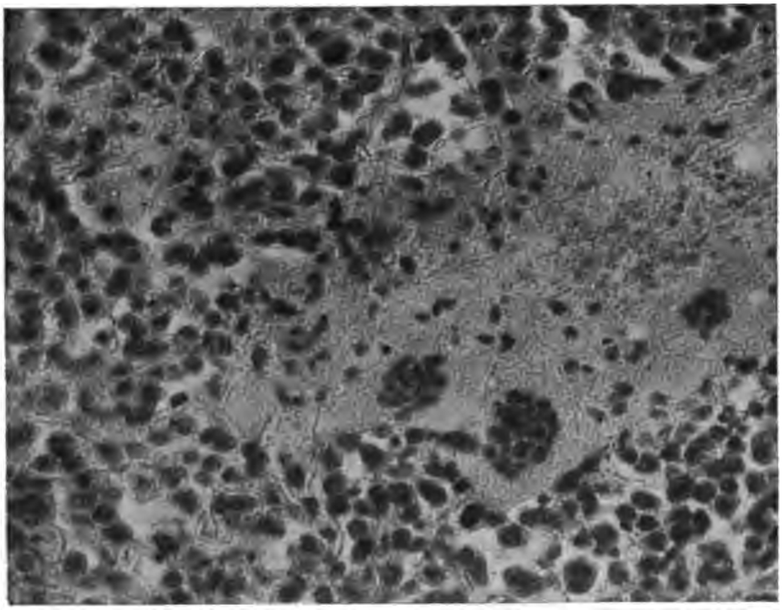

Figure XVI.—Human lymph gland after repeated exposures of ten minutes each; shows area of necrosis with giant cells.

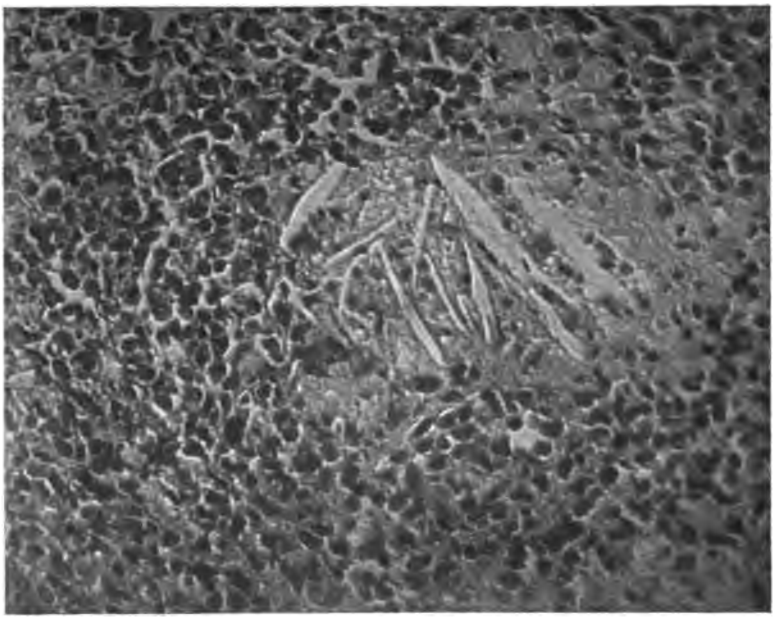

Figure XV.—Human lymph gland after repeated (nineteen) exposures of ten minutes each; shows area of degeneration with cholesterin clefts

fourteen minutes after the exposure, and the cells continued to disintegrate for several days. The greater part of the nuclear débris was removed long before that time.

LYMPH GLANDS.

The peripancreatic and mesenteric tissues were removed from all of the animals in Experiments I to XX inclusive, fixed in mercuric chloride or four per cent formaldehyde solution, imbedded in paraffin, stained with the ordinary stains, and examined for lymph-nodes. In some of the smaller animals none could be found. In these the stomach and appendix wall were also examined for lymphoid tissue. In all of the experiments the only constant lymph-node found was the one in connection with the pancreas. The changes found may be summed up as follows: Short exposures produced in the lymphoid tissues of the lymph-nodes changes similar to those produced in the spleen,—disintegration of chromatin, vacuolation of nuclei and cells, and finally a loss of the lymphocytes. These changes in the lymph-nodes were never so marked as in the case of the spleen; the number of chromatin granules in a given field of the spleen far exceeded that in a given field of lymph-node. The collection of chromatin granules in the germinal areas did not equal that in the splenic follicles. A further point of difference was the occurrence of a greater number of mitoses in the lymph-glands, which may be regarded as evidence of their greater power of regeneration.

Repeated or prolonged exposures reduced the number of leukocytes in the sinuses or vessels and also the number of lymphocytes in a node. The withdrawal of cells was most marked in the sinuses and in the follicles. The exhaustion of the lymphoid elements was never so marked in the lymph-glands as in the spleen, and even in the animal exposed for five hours in which the spleen was almost devoid of lymphoid elements the peripancreatic and mesenteric lymph-nodes showed numerous lymphocytes. These, however, approached more closely the character of the large lymphocytes than the small ones, having a larger ring of protoplasm and a more granular nucleus. No germinal centers were found in the five hour cases, but mitoses (apparently normal ones) were found in abundance all through the lymphoid areas. The sinuses were filled with large, pale epithelioid cells showing a marked vacuolation. Small islands of these throughout the lymphoid areas suggested the sites of germ centers which had been exhausted. Evidences of chromatin fragmentation were not numerous except in those animals dying soon after the exposure, and even in these the amount of cell destruction in the lymph-node did not strike the eye so prominently as in the case of the spleen. The small lymph-nodes of the intestine were smaller than normal in the exposed animals (five hours); they apparently contained normal lymphocytes as well as a few disintegrating lymphocytes. The intestinal and stomach wall were abnormally poor in leukocytes and lymphoid cells.

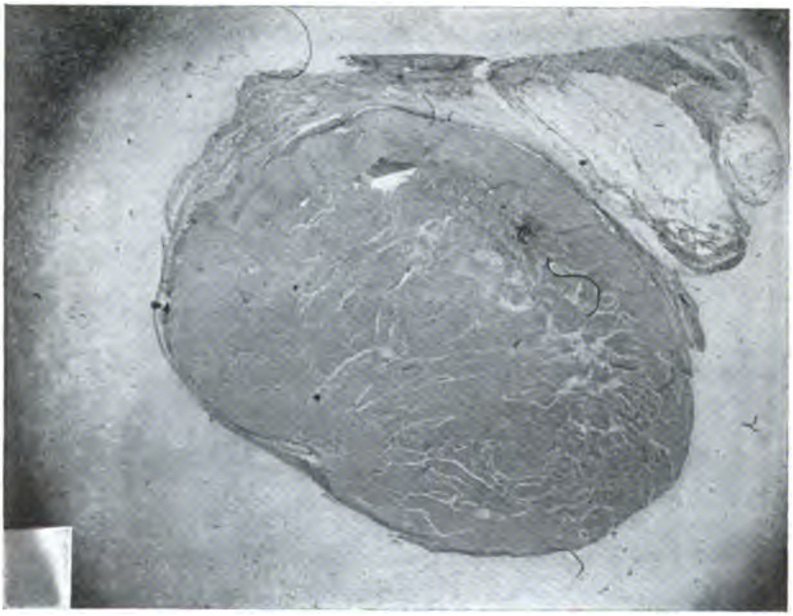

Figure XVII.—Human lymph gland after thirty exposures of ten minutes each every other day; shows complete necrosis.

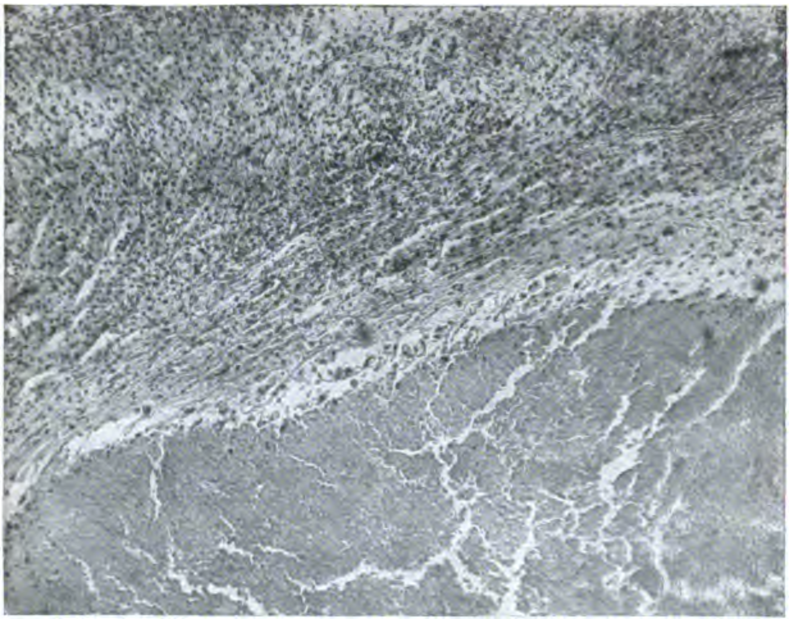

Figure XVIII.—Same gland as Figure XVII; high-power view of the edge of the necrotic area.

EXPERIMENTS XXXIX TO XLII.

Human cervical, inguinal, and axillary glands were exposed respectively as follows: ten minutes daily for thirty days to medium tube at eight inches, ten minutes daily for nineteen days, and ten minutes every other day for nineteen times. In all cases fatty degeneration and necrosis of the lymphoid cells were seen. Cholesterin plates were found in great numbers in the necrotic areas. The blood-vessels showed thickened intima and contracted lumen. The tissues about the gland were infiltrated with cells of large lymphocyte type as well as by fibroblasts.

SUMMARY.—The Roentgen rays experimentally cause also a destruction of the lymphoid cells of the lymph-glands. The action is selective in that the small lymphocytes are destroyed before any other cells. Slight irradiation causes fatty degeneration and vacuolation; intense irradiation causes nuclear disintegration. Repeated slight exposures cause ultimate necrosis. Regeneration may take place after the irradition is discontinued.

BONE-MARROW.

The bone-marrow of the animals experimented upon above was used for study, as well as that from other animals not mentioned in the protocols. The above series, however, illustrates fully the changes produced in the bone-marrow by Roentgen irradiation, and it is unnecessary to burden this paper with further details.

The marrow of the smaller animals was studied in smears only; that of the larger animals was easily obtained from the long bones (femur), and fixed in mercuric chloride, imbedded in paraffin and stained with ordinary stains, chiefly hematoxylin and eosin. The smears were fixed in equal parts of absolute alcohol and ether, and stained in hematoxylin and eosin, et cetera.

SUMMARY.—The effects upon the marrow are in general much less intense than those upon the spleen and lymph-glands. Single short exposures produce no perceptible changes; longer ones cause destruction of cells of the large lymphocytic and myelocytic types, the small lymphocytes not showing the marked disintegration found in the spleen. Longer and more intense exposures caused an increase in the number of the degenerating and vacuolating large lymphocytes and myelocytes, and a relative increase of the small lymphocyte form. No effects upon the red cells could be made out. Cells with eosinophilic granulation were not found in the marrow of any case irradiated. The effects upon the marrow are in exact relationship to the length and intensity of the exposure. There is an undoubted inhibition of white-cell production in the marrow immediately after irradiation. The large numbers of polymorphonuclears and degenerating polymorphonuclears indicate a preponderance of senile forms over the younger.

[TO BE CONTINUED.]

EDITORIAL COMMENT.

THE ELIMINATION OF DEFECTIVES BY EUTHANASIA.

WITH painful regularity some mental incomplete becomes seized of a desire to pose as benefactor of the human race and meanwhile achieve a modicum of renown by advocating the euthanasia method of terminating life. One of the latest promoters of the doctrine is Andrew Christian, who is reported to be a member of the Boston medical profession. Although Christian in name this revolting idea suggests the rôle of charlatan in nature, since the province of the true physician is not to slay life but to save it. The enthusiast is not content with arresting the lives of innocent babes, but would eliminate the mentally and physically delinquent in every stage of existence. The purification of the race is promised as the reward for this dire procedure. The wonderful achievements of Luther Burbank in the vegetable kingdom are cited, and the contention is advanced that results equally remarkable are possible in the human family. The idea of improving the condition of unfortunates is scouted, and a campaign of exclusion is proposed as the only means of ridding society of an undesirable element.

Were this innovation to become vogue, the physician, like Othello, might find his occupation gone. Instead of considering this phase of the question seriously, however, a word respecting the equity of the scheme will receive attention. However desirable the eradication of the defective class might be from the standpoint of racial perfection, the fact must not be ignored that the life of the individual belongs not alone to himself but to the higher power which was the author of its creation, and therefore cannot be justly yielded by self or kin for destructive purpose. The divine injunction, "Thou shalt not kill," is clearly expressed in the decalogue, and the most liberal interpretation of equity will not justify creature in filching from Creator and adding homicide to the theft. Even repudiation of the principle of dogma, the origin of decalogue, and the existence of Deity, will not clear the way for license to disregard the exhortation which constitutes the Golden Rule by allowing one individual to wantonly destroy the life of another. Fancy the inhumanity of a mother consenting to the death of an infant whose possibilities of life are beyond mortal conception. Were extermination just to the mentally degenerate or the physically deformed the process of perfecting nature might with some degree of success be conducted, and perhaps in the course of several centuries a comparatively ideal race might be evolved, but advocates of wholesale euthanasia are inclined to overlook the possibilities of even the apparently hopeless delinquent, the irreparable loss of which the world would sustain. A study of the lives of persons who have contributed much to literature, science, art, music, mechanics, et cetera, will reveal the names of many of lofty character and great mentality, upon whom defect was ineradicably stamped.

Were it within the power of man to bring about the millennium contemplated in this evanescent dream, would it be possible to obviate reversion? Would not heredity, in the light of modern research, extend its influence across the ages and exert a sinister effect upon the *perfect* race?

ANNOTATIONS.

RAM NARAYAN THE RODENT SAVIOR.

Superstition contributes largely to the continued prevalence of plague in India, as is attested by the disinclination of natives to destroy rats and other pests with which the country is infested. That rodents are largely responsible for the dissemination of disease is indisputable, but owing to deep-rooted religious beliefs they remain unmolested. Ram Narayan, a native banker, has ventured a remedy, which is calculated not only to preserve the lives of the "sacred" animals, but likewise to safeguard the public against disease transmission. He suggests the construction of a pen in which captured animals may be confined for their natural life as pensioners of the government, the sexes being segregated. That the English, who have been severely criticized for the the sanitary régime maintained in India, are laboring under great difficulties in the management of the Hindu, is apparent, and until superstition can be eradicated from the lives of these people, the transmission of disease is sure to prevail.

THE OUTLOOK FOR OSTEOPATHY IN CALIFORNIA.

Judge James, of the Superior Court of Los Angeles, recently rendered a decision which is calculated to cause practitioners of osteopathy a deal of inconvenience if universally accepted. This jurist, after a careful perusal of the law regulating osteopathic practice, declared it unconstitutional on the following grounds:

(1) It granted licenses to graduates of approved osteopathic institutions without examination.

(2) The law laid down no requirements as to what constituted an "approved institution," leaving that question for decision entirely to the Board of Osteopathic Examiners.

(3) A graduate of a nonapproved osteopathic institution had no means, by examination or otherwise, of having his qualifications tested.

California, besides supporting an institute of osteopathy, seems to be literally infested with practitioners of this cult and regular physicians have apparently become cognizant of the impending peril. A contemporary cites the fact that candidates are admitted to osteopathic schools on a common school education, and this, together with the incomplete medical instruction available in such schools, renders them utterly unfit to grasp the broad questions involved in medical practice. In applying for legislation to legalize the system, the idea is conveyed that only certain conditions will be treated, but once in practice the cult essays to treat every ailment to which human flesh is heir.

LACK OF AMBULANCES FOR LONDON ACCIDENT CASES.

THE inadequate ambulance service of the English metropolis gave rise to a discussion of the question in the House of Commons at a recent session. Sir William J. Collins, M. D., M. P., suggested that the Home Department make provision for the establishment of an ambulance corps to care for persons suffering accidents in the streets of London, but definite disposition of the matter was not effected. London possesses but few ambulances—these being the property of hospitals and the Order of Saint John of Jerusalem—and in the event of injury the victim is usually transported to the hospital in a four-wheeled cab, a policeman capacitating as medical attendant.

MEDICAL NEWS.

THE PASSING OF A BELOVED PHYSICIAN.

MANNING says that "When you come to die, your present character and your present life will be seen by you in a light brighter and more intense than that under which you see them now." If this declaration is entitled to credence there is indeed abundant reason for believing that a pleasing antemortem panorama greeted the vision of Gilbert Lester Rose, the well-known Michigan physician, who recently died at Decatur after ministering to the physical ills of that community for over thirty-two years. The life of this man was truly one of service and sacrifice, and the sublimity of the review certainly must have wafted comfort to one journeying toward the elysian fields of paradise. That generous qualities and Galenic qualifications had endeared him to an appreciative populace is attested by the mourning, incident to his demise, the town observing the obsequies.

Doctor Rose was born in Laporte county, Indiana, July 21, 1853. His early education was pursued in Laporte, and at the age of seventeen he entered the medical department of the University of Michigan, where he remained one year, after which he studied two years with his preceptor, graduating from the Cincinnati College of Medicine and Surgery in 1874. For a short time he practiced in Marcellus, Michigan, but later in the year of graduation he located in Decatur. On August

1, 1876, the doctor was married to Miss Mary E. Kelley at Cincinnati. Two sons were born of this union, both of whom, together with the widow, suffer an irreparable loss.

The funeral service was conducted in the town hall where, in addition to the usual ceremony, several addresses were delivered over the remains, the principal one being from the lips of a brother physician, Professor Reuben Peterson. The following is a verbatim report thereof:

A great and good man has passed away. Even at this time, when we meet to perform the last sad rites, it would seem as if we must testify to our love and appreciation of the friend who has gone. And let us not forget that in offering this tribute, it should be our desire and sacred duty to act in accordance with the wishes of Doctor Rose. An innately modest man, he would have instinctively shrunk from anything in the nature of an eulogy.

DOCTOR ROSE.

Our friend needs no high sounding phrases to establish his place in this community. His long and useful professional life in your midst has met with its just reward in the love, respect and confidence he has inspired in you, his friends, patients, and neighbors. We are not an emotional people, hence are not wont to express our appreciation of a man by outward manifestations. But there are other ways of giving expression to our feelings and this thought should comfort us in this sad hour, when we wish that we had another opportunity of showing our friend how much he was to us. He knew and knows what was and is in our hearts and with that we must be content.

It is only when a man like Doctor Rose is stricken down that we begin to realize what a continual sacrifice his life has been. How many hours was he able to call his own during the thirty-two years he has labored for and with you? Think of it, you who can arrange your regular hours for food and sleep. Think of it, you who grumble over a hard day's work but who can go to bed and have hours of uninterrupted sleep. How about driving far into the night after such a day's work? And not one night in a month or a year but oftentimes every night in the week. And thirty-two years of such a life. A country doctor for a third of a century! The wonder and grandeur of it all.

His whole life was a sacrifice and the end came, as one might have expected, from a cold contracted during a long ride across the swamp lands to render aid to one of his patients. But he died, as he would have wished to die, in the harness and working to the end.

How carelessly we speak of the doctor's being busy. We judge that he is busy, for we see his mud-covered buggy pass by and know that there is much sickness in the neighborhood. But we give it only a passing thought and busy ourselves in our own small affairs. Sometimes we have an inkling of the truth, when we summon the doctor in the middle of the night and find he has been called in an opposite direction. It may be nearly morning before he reaches us, as cheery as ever, but showing the effects of long pounding over rough country roads. He makes light of our thanks and is soon off to the next case. And these were but incidents in our friend's life and he kept this up for over thirty years, never resting, only rarely taking a few days' vacation. Is it any wonder that even his iron constitution could not withstand the strains placed upon it, and that he has gone from us while still in the prime of life.

Who does not remember Ian MacLaren's "A Doctor of the Old School" and has not felt a tightening in his throat as he read of the mourning in the glen when Doctor MacLure was laid at rest? He also had served his people "with a reserve and kindliness that never failed!" So closely does the life of Doctor Rose resemble that of William MacLure that their names might be interchanged and the context not disturbed. We thank God that such lives occasionally come within our ken. Truly may we echo Lord Kilspindie's prayer "that all doctors everywhere may share his spirit!"

The world is full of brave men who have in them the stuff out of which are fashioned true heroes. They volunteer and risk their lives and we are proud of them. But how many of them could keep up such heroism for over thirty years and not fall by the wayside? After a while they would weary and look forward to a time for rest. The life of a man like Doctor Rose is too hard for the majority of people. They feel their limitations and know that they can never hope to reach such heights.

For some time past Doctor Rose had not looked well and his friends had begged him to give up and take a rest. To one old friend who urged that he accompany him to California, he replied quietly, "I could not rest in California. These people need me and I cannot get away. Next month I will take a rest." And such a rest is he enjoying now, and the thought consoles us even in our sorrow. He certainly has earned his rest, and as much as we shall miss and need him, we should not begrudge it to him. "And there is rest for the people of God." And if ever a man has earned a place among the chosen people, it is Doctor Rose. I do not know what was his religious creed. In the face of a life such as his, the outward expressions of a man's religion pale into insignificance. His was the religion of love, forbearance, and helpfulness toward his fellow-men, and by that shall he be judged.

It so happened that I saw much of Doctor Rose during the past five years. The surgical care of many of his patients has fallen to me, and perhaps I am in as good a position as any one to judge of the hold he had upon them. Confidence is the word that expresses it. They trusted him, leaned upon him and abided by his decisions. They spoke of his extreme gentleness in the sick room and of how they looked forward to his visits. His men patients have smiled as they spoke of how, at times, the doctor had taken them to task, but always responded to their calls when they were in trouble. For he was a manly man, one who could give and take hard blows and be your friend after it was all over. To my question as to whether they knew Doctor Rose, patients from this vicinity would almost invariably reply, "Oh, yes, the doctor is a great friend of mine." And a friend he was in the true sense of the word—one to whom we instinctively turned when we were in need of support or advice.

There is small need for me to speak of Doctor Rose's skill as a physician. He was a man who kept abreast of the times, although I often wondered how he ever found time to read a line. In fact he did not have much time for reading, so busy a life did he lead. But he was a great student of disease as he saw it at the bedside; and because of his enormous practice and this constant study of his cases, his skill and judgment increased, as the years rolled on. No bookish, theoretical doctor was he. With a nature developed along broad lines, he viewed life and the details of his everyday work calmly and judiciously. Common sense, that quality which is so essential to the success of a physician, he had to a marked degree. I distinctly remember one case which we saw together, where I was inclined to take issue with him. With the greatest courtesy he said I might be right about certain physical findings but that he knew the patient much better than I and that my lack of knowledge of this particular patient had led me to wrong conclusions. So convincingly did he set forth the facts in the case from his viewpoint that I gave way to his opinion. The subsequent history of the patient showed him to be entirely in the right.

He was a devoted husband and father. He was always planning for the futures of his boys. Never did we meet but that this subject was discussed. And it is significant that, in spite of his hard professional life, he would have been glad if both of them had elected to practice medicine. Here was no whining self-pity, no shake of the head and the statement that no one belonging to him should ever take up medicine with his consent. He was contented with his lot, hard as it may seem to some; nay, more, he enjoyed his work and would have been pleased to see those dearest to him continue it.

Our most tender sympathy goes out at this time to the afflicted wife and sons. May strength be furnished them to bear their great sorrow. But what a glorious heritage is theirs. May the remembrance of their father's life ever prove a source of inspiration to these sons he loved so well. May his example so guide and strengthen them, that at the end, when they too lay down their burdens, it may be said also of each of them: "Well done, thou good and faithful servant."

And for each one of us let the lesson of this hour be brought home. In remembrance of him whom we knew and loved so well let us resolve to put aside the trivial things that now count so much in our lives. Let us try to help our fellow-men even as unselfishly as did he. And let devotion to a high ideal be also our chief aim in life, and at the last may our efforts also be crowned with success.

MINOR INTELLIGENCE.

THE lower house of the New York legislature has passed a bill prohibiting the sale of cocain and all other preparations containing the drug, except in physicians' prescriptions.

THE new Battle Mountain Hospital at Hot Springs, South Dakota, is rapidly nearing completion. The institution will comprise ten stone buildings and the estimated cost is $750,000.

A FINE of seventy-five dollars was recently imposed on a midwife at Magdeburg, Germany, for slandering a physician. She asserted that he commenced an obstetric operation without disinfecting his hands.

COLONEL WILLIAM C. GORGAS, M. D., late chief sanitary officer of the Isthmian Canal Commission, has been appointed a member of the Commission in recognition of his efficient service in the Canal zone.

ACCORDING to a contemporary the German authorities have abolished Latin and Greek as units in the preliminary requirements of medical colleges. Only a sufficient amount of Latin to enable the student to comprehend scientific terms will be required.

HARVARD medical faculty has recently given to the public a series of free lectures on subjects pertaining to the prevention of disease and the maintenance of public health. The lectures were delivered Saturdays and Sundays in the new medical building.

DOCTOR EDWARD H. TROY, formerly of Ann Arbor and Detroit, delivered the address of welcome at the second annual banquet of the University of Michigan Alumni Association of the State of Oklahoma, a function held at the Busby Hotel in South McAlester.

THE National Medical Association, comprising physicians, dentists, and pharmacists, will meet at Baltimore on August 27, 28 and 29, 1907. The officers are: President, Doctor N. F. Massell, of Philadelphia; secretary, Doctor John F. Kinney, of Tuskegee, Alabama; chairman of executive board, Doctor P. A. Johnson, of New York; secretary of executive board, Doctor A. R. Collins, of Washington.

M. Daniel Iffla Osiris, a Jewish financier of Paris, who died recently, left half of his fortune to the Pasteur Institute of that city. The bequest amounts to about five million dollars, which in France will assure the Institute a yearly income of two hundred thousand dollars.

At the recent meeting of the American Otolaryngologic Society held at Cleveland, Professor R. Bishop Canfield, of the University of Michigan, read a paper on "Submucous Resection of the Lateral Wall of the Nose," an operation lately devised by the doctor and practiced in the University Hospital.

Henceforth the curriculum of McGill University Medical School will extend over five years, the last one being devoted entirely to hospital work. This is indeed a commendable move on the part of the authorities of the Canadian school, but whether the time is ripe for its general adoption remains to be seen.

Wisconsin is considering the advisability of subjecting the chronic insane and feeble-minded to operations for the production of sterility. The idea has progressed so far that the legislative committee has visited the asylums and recommended adoption of the measure as a means of preventing the increase of this unfortunate class.

The health authorities of Spokane are endeavoring to abolish the free lunch in saloons. That this feature is a breeder of much infection through the medium of common utensils and cheap food stuffs is indisputable, and since saloonists condemn the lunch as an extra expense and inducement to loafers it is probable that the authorities will eliminate the evil.

Holland has inaugurated a novel plan for raising funds with which to institute a campaign against tuberculosis. A new series of postage stamps has been issued, the cost ot which is fifty per cent greater than those previously used. The extra charge will be devoted to the cause and the new stamp will serve as a constant reminder to the people to aid in the combat.

Doctor Wolfran C. Fuchs, of Chicago, one of the pioneer workers in radioscopic technic in this country, died recently at the early age of forty-one years. His was one of the earliest *x*-ray laboratories in the United States, and two years ago the thumb of one hand and the first two fingers of the other began to evidence symptoms of exposure to the rays. Amputation failed to remedy the condition and death finally resulted.

Sr. Excellency Herrn Geheim-Rat Ernst von Bergmann, professor of surgery at Berlin, recently celebrated his seventieth birthday. Both the *Deutsche Zeitschrift für Klinische Chirurgie* and the *Archiv für Klinische Chirurgie* published large zeitschrifts in honor of this noted surgeon. In addition he was honored by the city of Berlin, the British Medical Society, the Red Cross, and the German government by various gifts and degrees.

RECENT LITERATURE.

REVIEWS.

REFERENCE HANDBOOK OF THE DISEASES OF CHILDREN*

THIS translation puts into our possession the large experience of Professor Fruhwald, who has been for many years devoting himself to his specialty at the Polyclinic at Vienna. This reference handbook is an eminently practical one and is thoroughly brought abreast of the pediatric knowledge of the present day with additions by Doctor Westcott. It is replete with interesting illustrations of disease conditions. The completeness with which the author outlines the treatment, together with the novel alphabetical arrangement of the subjects, make this volume indispensable to a physician's library.

A. D. H.

*For students and practitioners. By Professor Ferdinand Fruhwald, of Vienna. Edited, with additions, by Thompson S. Westcott, M. D., Associate Professor of Diseases of Children in the University of Pennsylvania. Octavo volume of 553 pages, with 176 illustrations. Cloth, $4.50 net; half morocco, $5.50 net. Philadelphia and London: W. B. Saunders Company, 1906.

A TREATISE ON SURGERY—VOLUME II.*

VOLUME I of this work was issued several months ago and has already has been reviewed in this journal. This volume supplements the first by completing the full consideration of regional surgery. It takes up in order the Surgery of the Dorsal and Lumbar Vertebræ, Surgery of the Abdominal and Pelvic Regions, Surgery of the Female Pelvic Organs, Surgery of the Upper Extremity, and Surgery of the Lower Extremity. The favorable mention made of Volume I is deserving of repetition here. Each portion of the whole work shows the touch of a master in surgery. The text is clear, strong and fresh. The illustrations, too, are new and well adapted. The publishers deserve commendation for the attractive form in which the work comes into our hands.

F. B. W.

*By George R. Fowler, M. D., Examiner in Surgery, Board of Medical Examiners of the Regents of the University of the State of New York; Emeritus Professor of Surgery in the New York Polyclinic, et cetera. Two imperial octavos of 725 pages each, with 888 text illustrations and 4 colored plates, all original. Philadelphia and London: W. B. Saunders Company, 1906. Per set: Cloth, $15.00 net; half morocco, $17.00 net.

The Physician and Surgeon

A PROFESSIONAL MEDICAL JOURNAL.

VOLUME XXIX. MARCH, 1907. NUMBER III.

ORIGINAL ARTICLES.

MEMOIRS.

INFANT FEEDING.*

JOHN LOVETT MORSE, A. M., M. D.

ASSISTANT PROFESSOR OF PEDIATRICS IN HARVARD MEDICAL SCHOOL; ASSISTANT PHYSICIAN AT THE CHILDREN'S HOSPITAL AND AT THE INFANTS' HOSPITAL; VISITING PHYSICIAN AT THE FLOATING HOSPITAL, BOSTON.

EVERYONE will admit, I think, that the natural food for an infant is its own mother's milk. Unfortunately, the baby of today is often deprived of its natural food, the reason being that the modern woman is either unwilling or unable to nurse her child. Many women who are unwilling to nurse their children would be willing to do so, I am sure, if they were made to appreciate the importance of nursing and the dangers of artificial feeding. It is the duty of the physician and nurse to teach the mothers these things, a duty which, I am sure, they often fail to perform. Many women, moreover, who are thought to be unable to nurse their babies are really able to do so, the physician being mistaken in his judgment as to their ability. Perhaps the most common cause of this mistake is that the physician does not realize how late the milk may be in appearing, and consequently gives up the attempt at nursing too quickly and takes refuge in the bottle unnecessarily. Another reason why women do not nurse their babies is the popular belief that it is harmful to a baby to be fed partly on the breast and partly on an artificial food. This belief is, of course, erroneous, as human milk is not only itself the best food but aids materially in the digestion and utilization of artificial foods. Even a little helps; none should be wasted. I find, however, that many women stand the strain of nursing better if they give the baby one, or even two, bottles a day. This enables them to attend to their business and social duties and to get recreation and rest.

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* Read at the dedicatory exercises of the Palmer Ward for Pediatric Cases at the University of Michigan, February 11, 1907.

It is not enough for a baby to nurse; it must be nursed at regular intervals. It makes little difference whether the baby takes the breasts alternately or both breasts at the same nursing. The greater part of the milk is taken in the first five minutes, the amount taken after this diminishing progressively with the duration of the nursing. The baby should be satisfied in twenty minutes. If it is not, there is usually not enough milk. It should not be made to nurse after it has voluntarily ceased. The baby is not a measure that has to be filled to the brim once in so often. It is like older people, and does not always want the same amount at each meal.

You are familiar, I am sure, with the analysis of human milk. It contains about four per cent of fat, seven per cent of sugar and one and one-half per cent of proteids, the larger part of the proteids being in the form of the soluble or whey proteids and the smaller part in the form of casein. Human milk is amphoteric in reaction, sterile, contains characteristic ferments and gives a definite serum reaction. Human milk is not a constant quantity, however. The milk of different women varies and the milk of the same woman varies from day to day and nursing to nursing. The variations are greatest in the fat, considerable in the proteids and least in the sugar. The percentage of proteids gradually diminishes toward the end of lactation. On account of the normal variations in the composition of human milk, already spoken of, analyses are often misleading, and too much reliance should not be placed upon them. The analysis does not matter if the milk agrees with the baby.

If a baby that is not gaining on breast milk has one normal stool daily the trouble is probably not in the milk. If a baby is not gaining on breast milk and has no disturbance of digestion, the milk may be deficient in quantity, quality, or both. Long nursing, stopping and crying out during nursing and putting the hands in the mouth are suggestive but unreliable signs of a deficiency in the quantity. Inspection and palpation of the breasts give no information of any value, the general impression to the contrary. The only sure way to determine as to the quantity of the milk is by repeated weighings before and after nursing. The quality of the milk can only be judged by analysis of the milk. Great care must be exercised in drawing conclusions from such analyses, however, because of the normal variations already mentioned. If a baby is not gaining and the digestion is disturbed, the difficulty may be, again, either in the quantity or quality of the milk. If the quantity is too large it is shown by spitting up and by an excessive number of movements. Much can be learned as to the composition of the milk by careful clinical study of the stools. The most common cause of trouble is too high a percentage of proteids, less frequently an excess of fat, rarely an excess of sugar.

Lactation is a physiologic and not a pathologic condition, and should be treated on this basis. The nursing woman ought to lead her usual life and not be treated as an invalid. She should have exercise and work of the sort to which she is accustomed. The amount may, however, need to be diminished. She should take her usual food, but more of it. She should have a good general diet and not "slops." She must have light and air and must not be shut up in the house. Cows do not give good milk under these conditions; neither do women.

Much more can be done in modifying the character of the breast-milk than is usually realized. The most important method of increasing the quantity of the milk is by the use of the breasts. Within reasonable limits, the more there is taken the more there is produced. Other methods are entirely subordinate. Among them may be mentioned: first, improvement of the general condition; second, a liberal diet. It is very doubtful if "slops" increase the amount materially. Gruel is the best of them. Malt liquors are of little use, drugs of none. The total solids vary with the intervals between the nursings. Lengthening the interval weakens the milk, shortening it strengthens the milk. The fat varies directly with the amount of proteids in the food. The sugar cannot be influenced in any way. The proteids vary with the amount of exercise, being diminished by exercise, but increased if it is excessive. They also vary directly with nervousness and excitement. These are the most common causes of high proteids in breast milk and are the most difficult to correct. They compel us to give up nursing more often than any other single cause. When all the elements are too high the cause is usually too much rich food and laziness. This type of milk can usually be corrected by starvation and exercise. When the fat and sugar are low and the proteids high the cause is usually insufficient food and overwork. This type can usually be corrected by rest and food. When the fat and sugar are very low and the proteids very high the cause is usually excessive nervousness and is irremediable.

When a woman is unable to nurse her own baby the milk of another woman is unquestionably the best substitute. No other food can entirely take the place of human milk. While this is true, it is fortunately usually possible, nevertheless, by the use of modern methods of artificial feeding to dispense with wet nurses. In some cases, however, a wet nurse is absolutely necessary, even the most careful artificial feeding proving unsatisfactory. The more experience that I have in infant feeding, the more ready I am to give up artificial feeding when babies are not doing satisfactorily and to have recourse to a wet nurse. I make it a rule not only never to allow a baby to die without giving it the advantage of human milk, but also never to allow a baby to get into a condition in which I fear that it may die without getting it a wet nurse. Wet nurses are, of course, often a great deal of a nuisance in a family. One Harvard professor defines them as one part cow and nine parts devil. I have found them very much like other people:

good, bad and indifferent. A mother should be willing, however, to submit to any amount of annoyance and inconvenience in order to save the life of her child.

A wet nurse must be well and free from syphilis and tuberculosis. Next to this the most important thing to be considered in picking out a wet nurse is whether her own baby is thriving or not. If her own baby is healthy, gaining weight, and digesting well, her milk must be good. Analysis of the milk is of no importance, as it is impossible to say in advance what milk will agree with an individual baby. Moreover, the composition of the milk is very likely to change with a change in the surroundings. The age of the milk is unimportant except that the colostrum stage must be passed and that it is not wise to start a young baby on a milk more than six months old, as it may give out too soon. Color, social condition and moral character are unimportant as regards the character of the milk, however important they may be as regards the relation of the wet nurse to the family.

When, for any reason, it is impossible for an infant to get human milk it must be given some substitute food. The only satisfactory substitute is the milk of some other animal. While the milk of some animals resembles human milk more closely than does that of others, they all differ so materially in their composition from human milk that they have to be modified in some way to make them useful as foods for the infant. There is no advantage, therefore, in the milk of other animals over that of the cow, while this has the great advantage of being easily obtainable anywhere and in any desired quantity. Some modification of cows' milk, therefore, is the only rational and practicable substitute for human milk. While a very satisfactory food for infants may be made from cows' milk, it is now impossible, and probably always will be impossible, to make a food exactly like human milk from cows' milk. It is simply enough to imitate the percentages of fat, sugar and proteids in human milk, or, in fact, to get any desired percentage of these ingredients by modifying cows' milk. It is impossible, however, to get the salts in the same combination as in human milk, to change the character of the enzymes of cows' milk, to introduce new ones, or to change an heterogenous to an homologous albumen, as would have to be done in order to make cows' milk exactly like human milk. It must never be forgotten, therefore, that modified cows' milk is not human milk and never will be. When we realize this fact we shall expect less of it.

Modification of cows' milk for infant feeding is necessary because of the difference in the relations of the organic constituents in human and in cows' milk. While both contain the same amount of fat, cows' milk contains nearly four per cent of proteids in comparison with one and one-half per cent in human milk, and only four and one-half per cent of sugar in comparison with seven per cent in human milk. The proteids, which are the most difficult of digestion, must be reduced in some way. This cannot be done by simple dilution of the milk, because this reduces the fat also. It can be done, however, by the use of creams which contain a proportionately higher percentage of fat in relation to the proteids. A dilution of milk, for example, in the proportion of one to three gives a fat percentage of only one with a proteid percentage of .90, while a dilution of sixteen per cent, or gravity cream, in the same proportion gives a fat percentage of four in combination with the same percentage of proteids. Proper modifications of cows' milk can be made, therefore, only by the use of creams. The proteid percentage can be raised to any desired point by the addition of skim milk, and the sugar by the addition of milk sugar.

The dilution of cream, however, does not give the same relation between the soluble proteids and the casein in the mixture as exists in human milk, because the relation between them is not the same in cows' milk as in human milk, the greater part of the proteids of human milk being in the soluble form, while only a small proportion of the proteids of cows' milk is in this form. This is one of the reasons why modified cows' milk is so often poorly digested by the infant. Many attempts have been made to remedy this difficulty and to make the proteids of cows' milk more like those of human milk.

Perhaps the most rational and satisfactory of the methods which have been employed for this purpose is the whey mixture. When cream containing a very high percentage of fat is used, a very low percentage of proteids in combination with a reasonable percentage of fat can be obtained by dilution of the cream. The amount of proteids can then be raised by the addition of whey, the proteids of which are in the soluble form. Whey mixtures are consequently much more easily digested than ordinary mixtures. The proteids of whey, however, although soluble, are not the same as the soluble proteids of human milk and are still heterogenous for the infant. A very important limitation to the use of whey mixtures, moreover, is the fact that they have to be made with high percentage creams, which are often difficult to obtain.

Another method which is much used for rendering the proteids of cows' milk more digestible is peptonization, or rather pancreatization, of the mixtures. Pancreatization, however, does not make the proteids "like those of human milk," but merely increases their digestibility. When using pancreatization in infant feeding it is much better to pancreatize mixtures modified to suit the individual baby than to use the routine mixtures and methods advised on the can of some manufacturer. Neither the pancreatized nor the whey mixtures should be used for long periods of time because they do not call for work enough to properly develop the digestive powers of the gastrointestinal tract.

Another method of rendering the proteids of cows' milk more digestible is by the addition of cereal diluents, such as barley water, rice water and oatmeal water. These do not change in any way the charactér of the proteids, but by their mechanical action in preventing the formation of large curds, make their digestion easier. It has been found that the mechanical action of these cereal diluents is due largely to the starch which they contain. A part of their action probably depends, however, on the presence of finely divided vegetable fibre. It has also been found that the mechanical effect of three-fourths of one per cent of starch is as great as that of larger amounts. This amount of starch is not beyond the digestive capacity of the average infant and consequently can do no harm. Larger quantities are unnecessary and may disturb the digestion. If larger amounts are used, they should be given solely for their nutritive value and not for their mechanical action. It is to this mechanical action of the starch and vegetable fibre which they contain that many proprietary foods used with milk owe their success when ordinary modifications of milk have failed. Most of these foods, however, contain a considerably larger amount of starch than is necessary and are therefore liable to disturb the digestion.

The casein of buttermilk is in the form of the lactate, which is not acted on by rennen, and is very finely divided as the result of the churning during the manufacture of the butter. The formation of large curds in the stomach is therefore prevented and the work of the stomach much simplified. For these reasons buttermilk is often well digested when ordinary modifications are not.

Citrate of soda has been much used recently to render the proteids more digestible. The addition of this salt to milk, in the proportion of one grain to the ounce, delays the coagulation of the casein and makes the curd finer and more flocculent. There is much difference of opinion as to its chemical action, but the most recent work seems to show that it is decomposed and acts merely as sodium chlorid. It has been used hitherto in a routine way with whole milk or with milk simply diluted with water. Better results ought to be expected from its use in combination with milk mixtures modified to suit the individual infants.

The action of alkalies on the digestion of milk, especially of the proteids, has been very generally misunderstood in the past. The recent studies of Van Slyke and Hart show that the chief action of alkalies is to delay the action of rennen and consequently the stomach digestion. According to the proportion of alkali which is added to the mixture, more or less milk passes unchanged from the stomach into the intestine, thus diminishing the work of the stomach and throwing it upon the intestine. Alkalies have no direct action on the digestion of proteids. They should be used, therefore, purely to relieve the stomach of more or less of its work. They may do decided harm in intestinal indigestion by increasing the work to be done by the intestine. The amount of alkali to be used depends on the amount of milk and cream in the mixture and not on the total amount of the mixture, as it is the relation between the alkali and the milk and cream, and not that between the alkali and the water, which is important.

It is necessary, in feeding babies with modified milk, to think and calculate in percentages of fat, sugar and proteids, and not in quantities of cream, milk, sugar and water. The various quantities of the different ingredients of the mixture must not be regarded as the primary factors but merely as the results of the problem. They represent not the ultimate elements of the food but only the means by which these elements are obtained. It is only by calculating in percentages that approximately accurate results can be attained. All other methods of calculating are shiftless and inaccurate and usually unsuccessful in their results.

Modified milk for infant feeding may be prepared either at laboratories established for the purpose, or at home. It can undoubtedly be prepared more accurately in the laboratory than at home. Whether it is or not depends entirely on the care which is exercised at the individual laboratory. When laboratory feeding is not successful the system is not necessarily at fault. The laboratory may be doing its work perfectly and yet the babies taking the milk may not be thriving. In such cases the trouble is not with the laboratory which furnishes the mixtures but with the physician who orders them. The laboratory is not infrequently the scapegoat of the incompetent and ignorant physician.

If modified milk is prepared at home the physician must know the composition of the milk and cream with which he is working and how to use them. He must give explicit directions as to every step in the preparation of the food. Unless this is done good results cannot be expected. He must pick out some method of calculation and master it. There are many good methods. It makes little difference which one is used, provided it is used properly. Most of them are simple and not at all difficult to understand. The percentage method of feeding and the calculation of the formulæ of milk mixtures on the percentage basis are comparatively simple matters and not beyond the mental ability of anyone who has a medical degree. They are well worth the time required to master them. The reasons that they are not more generally used by physicians are because they either do not appreciate the importance of infant feeding or are too lazy to take the trouble to learn how to feed properly. It is never because the method is too difficult for them to grasp. There is, moreover, nothing about the preparation of modified milk at home which is beyond the comprehension or ability of any ordinary woman.

It must be remembered that it is impossible to make a proper food for babies from bad milk. In order to get satisfactory results, the milk must be a fairly constant one, clean, fresh, and reasonably free from bacteria and their toxic products. Few realize, I think, unless they have looked into the matter, how old, how dirty and how contaminated ordinary market milk is, or how many bacteria it contains. There is no time for me to take up in detail the methods to be employed in the production of pure, clean milk. Admirable results have been obtained, however, in many cities under the direction of Milk Commissions. The requirements of the Milk Commission of the Suffolk District Medical Society, in Boston, are briefly as follows: "The milk shall be free from pus and pathogenic organisms, and contain not more than ten thousand bacteria to the cubic centimeter. It shall contain not less than three per cent nor more than four per cent of proteids, not less than four per cent nor more than five per cent of sugar, and not less than three and one-half per cent nor more than four and one-half per cent of fat. It shall be free from preservatives, coloring matters and other contaminations, and it shall not have been subjected to the action of heat. It shall be cooled to a temperature of 45° Fahrenheit within an hour of milking and shall be kept at this temperature up to the time of delivery. It shall not have been frozen. The cows shall be healthy, and free from tuberculosis, as shown by the tuberculin test. The employees shall be healthy and cleanly in their persons and habits. They shall not suffer from, or have recently been exposed to, any infectious disease. The milk shall be delivered in glass bottles, sealed in a manner satisfactory to the Commission."

There is much difference of opinion as to whether milk should be sterilized or pasteurized, or given raw. Some claim that it should always be heated and others that it should never be. Both are wrong. There can be no doubt that the heating of milk does harm by destroying the ferments and by breaking up some of the organic combinations of the salts, and that the milk is therefore rendered less suitable as a food for infants. There can be no doubt, on the other hand, however, that the heating of milk destroys the bacteria, and that these bacteria, especially in the summer, are the cause of much illness and of many deaths. It has been proved conclusively that pasteurization destroys all pathogenic bacteria, and that for all practical purposes it is as effective as sterilization. Sterilization, moreover, causes more changes in the milk than pasteurization. Milk should, therefore, never be sterilized but only pasteurized. Whether it should be pasteurized or not depends on the circumstances in the individual case. If it is winter and the milk supply is a good one, it is usually better not to pasteurize. If it is summer and the milk supply is a good one, it is usually advisable to pasteurize; if it is not a good one, it is necessary to pasteurize.

The breed of cows which furnishes the milk is also of importance. Babies do better on the milk of Ayreshires and Holsteins, which is comparatively low in fat, than they do on the milk of Jerseys and Guernseys, in which the percentage of fat is greater and in which the fat globules are larger and the proportion of fatty acids higher.

It is necessary in artificial feeding not only to regulate the interval between the feedings, as in breast feeding, but also to regulate the amount at each feeding according to the size and age of the individual infant. The supply of milk provided by nature corresponds to, and varies with, the needs of the infant within fairly narrow limits. There is no constant relation, however, between the size of the nursing bottle and that of the baby's stomach. The average capacity of the stomach at various ages has been pretty definitely determined, and serves as a guide as to the amount of food to be given. This must be regulated, however, by the needs of the individual baby and not by tables of averages.

The composition of human milk varies but little during the whole period of lactation, although it becomes a little weaker toward the end. Experience has taught us, however, that in artificial feeding it is not safe to follow nature in this respect. A young baby can not take as strong an artificial food as an older one. The food must be very dilute in the beginning and gradually strengthened as the baby grows older. It is never a mistake to begin with an extremely weak food. More harm is done and more disturbance of digestion caused by giving too strong mixtures in the early days and weeks of life than at any other time. It must be remembered that while babies of the same ages take foods of approximately the same strength, all babies of the same age cannot take food of the same strength. Individual peculiarities play an important part, and the strength of the food must be varied to suit the individual infant. The baby and not general rules must be followed in preparing the food.

In conclusion: It is impossible to feed babies by rule. Babies are not all alike. Each one is a law unto itself. Rules are useful only to start by; after this the baby must be followed. Success in infant feeding comes from knowledge as to what is the matter with the food if it does not agree. This knowledge can only be obtained by experience and observation.

Boston, Massachusetts, 70 Bay State Road.

AN EXPERIMENTAL STUDY OF EFFECTS OF ROENTGEN RAYS UPON THE BLOOD-FORMING ORGANS, WITH SPECIAL REFERENCE TO THE TREATMENT OF LEUKEMIA.

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[CONTINUED FROM PAGE 87.]

PART III.—TREATMENT.

HEINEKE'S reports (1903, 1904) of the effects of Roentgen rays upon the lymphoid tissues of animals would certainly have been taken as a basis for a therapeutic application of Roentgen irradiation in leukemia and pseudoleukemia had this not already been done from the purely clinical side from reasons in part empirical and in part experimental. To a small group of American physicians belongs the honor

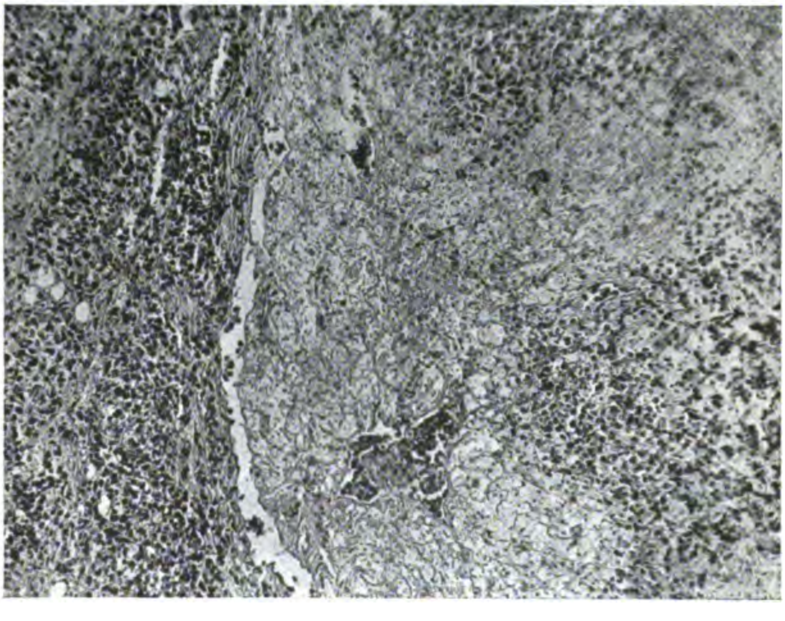

Figure XIX.—From a case of lymphatic leukemia; cervical gland after thirty exposures of ten minutes each; shows area of fatty degeneration.

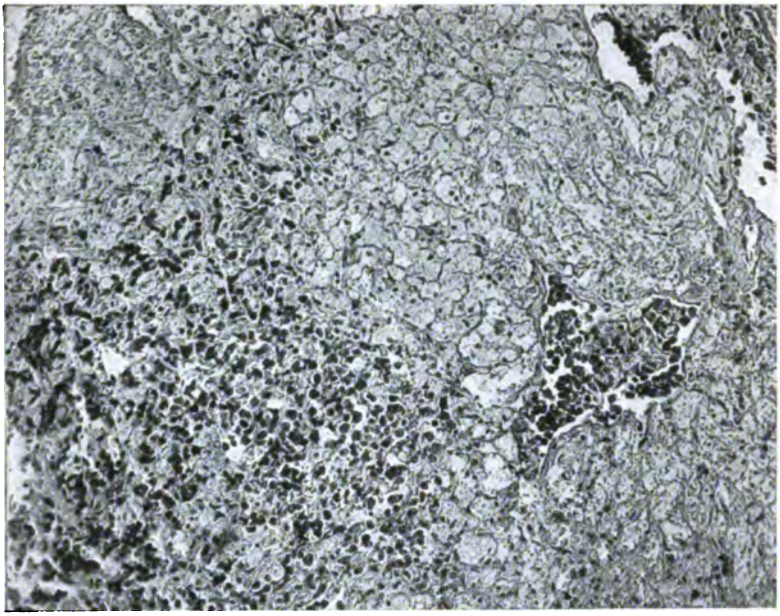

Figure XX.—Same case as Figure XIX under higher power; shows fatty vacuoles in lymphoid cells.

of the discovery of the remarkable effects produced by Roentgen rays in leukemia. Pusey in 1902, Senn in 1903, Brown, Bryant and Crane, and Weber in the first half of 1904 were the first to extend the use of Roentgen irradiation to the treatment of this disease. The conception of leukemia as an infection and the analogy existing between it and the neoplasms were probably some of the reasons leading to such a therapeutic procedure. At any rate, the remarkable results obtained by the new treatment and the reports of these cases as cured have excited the greatest interest, and the treatment is being applied very generally, as is shown by the constantly increasing number of reports of cases of leukemia so treated.

The number of these cases now exceeds one hundred. They have been reported as follows: (1) Pusey,[88] (2) Senn,[89] (3) E. J. Brown,[90] (4) Bryant and Crane,[91] (5) Weber,[92] (6) Krone-Gottschalk,[93] (7) Ahrens,[94] (8) Guilloz and Spillmann,[95] (9) Aubertin and Beaujard,[96] (10 and 11) Bozzola-Guerra,[97] (12) Stone,[98] (13) Vaguez and Laubry,[99] (14) Rhode,[100] (15) Köster,[101] (16) Evans,[102] (17 and 18) Fried,[103] (19 to 27) Capps and Smith,[104] (28) Schweinburg,[105] (29) Soetbeer,[106] (30 to 32) Krause,[107] (33) Churchill,[108] (34 to 36) Senator,[109] (37) Krause,[110] (38) Cheney,[111] (39 to 42) Hoffman,[112] (43) Schultze[113] (44) Leick,[114] (45) Kleinschmidt,[115] (46) Grad,[116] (47) Dunn,[117] (48) Taylor, [118] (49) Chester,[119] (50) Eastmann,[120] (51) Gra-

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[88] *Journal of the American Medical Association, 1902.*
[89] *New York Medical Journal, 1903.*
[90] *Journal of the American Medical Association, 1904.*
[91] *Medical Record, 1904.*
[92] *American Medicine, 1904.*
[93] *Münchener medizinische Wochenschrift, 1904.*
[94] Ibidem.
[95] *Semaine médicale, 1904.*
[96] *Presse Médicale, 1904.*
[97] *Gazetta degli ospedali, 1904.*
[98] *Journal of the American Medical Association, 1904.*
[99] *Gazetta des Hopitaux, 1904.*
[100] *Deutsche medizinische Wochenschrift, 1904.*
[101] *Deutsche medizinische Wochenschrift, 1904.*
[102] *American Medicine, 1904.*
[103] *Münchener medizinische Wochenschrift, 1904.*
[104] *Journal of the American Medical Association, 1904.*
[105] *76 Versammlung deutsche Naturforscher und Aerzte, 1904.*
[106] Ibidem.
[107] Ibidem.
[108] *American Journal of the Medical Sciences, 1904.*
[109] *Berliner klinische Wochenschrift, 1904.*
[110] Ibidem.
[111] *Medical News, 1904.*
[112] *Münchener medizinische Wochenschrift, 1904.*
[113] Ibidem.
[114] Ibidem.
[115] Ibidem.
[116] *Journal of Advanced Therapeutics, 1904.*
[117] *American Practitioner and News, 1904.*
[118] *Cincinnati Lancet-Clinic, 1904.*
[119] *Chicago Medical Recorder, 1904.*
[120] *Denver Medical Times, 1904.*

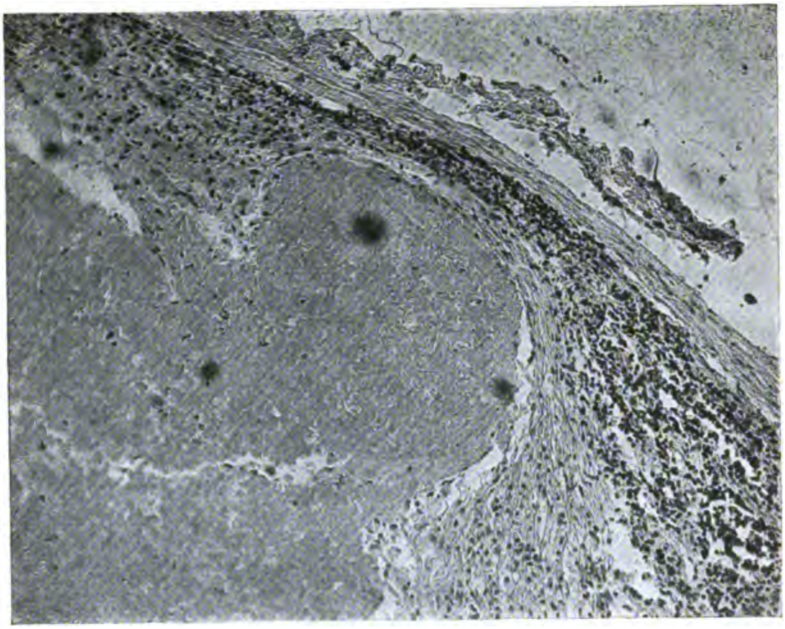

Figure XXII.—Same as Figure XXI, showing edge of necrotic area.

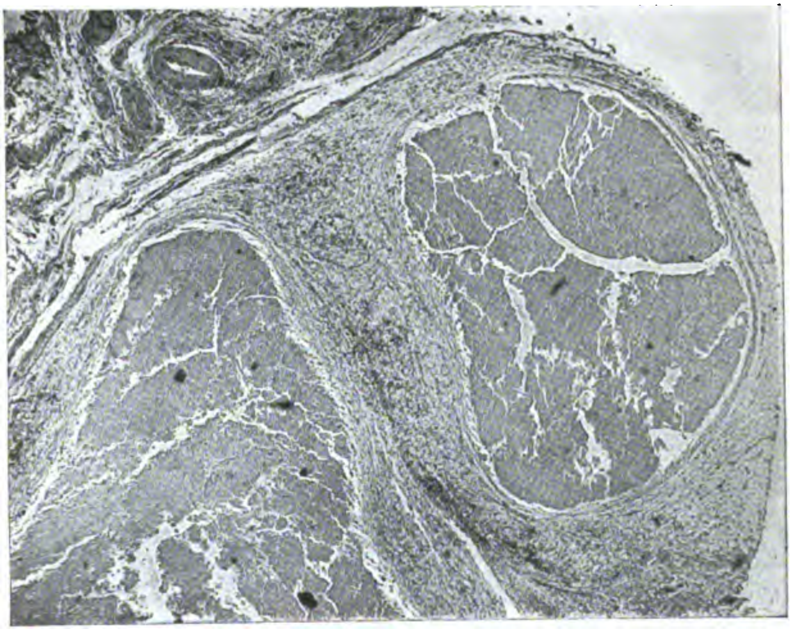

Figure XXI.—Cervical gland from case of lymphatic leukemia after thirty exposures of ten minutes each; shows complete necrosis.

witz,[121] (52) Schenck,[122] (53) Park Weber,[123] (54) Cahen,[124] (55) Joachim and Kurpjuweit,[125] (56) Ledingham and McKernan,[126] (57 to 58) Meyer and Eisenrich,[127] (59) Wendle,[128] and (60-64) Schieffer,[129]. The rapid increase in the reported number of cases of leukemia placed under this treatment prevents giving of the reference in full for 1906, Attention is, however, directed to reports and articles by Ledingham and McKerron, Levack, Aubertin and Beaujard, Maragliano, Curschmann and Gaupp, Klieneberger and Zoeppritz, Belot, Ransom, Thompson, Pancoast, Rosenstern, Arneth, Krause, Nutt, Pfeiffer, Brigante-Colonna, Aubertin, Engel, De la Camp, Schirmer, Hoffmann, Cramer, Warburg and Capps and Smith. The references to these articles may be found in the *Fortschritte aus dem Gebiete der Röntgenstrahlen* and the *Archives of the Röntgen Rays* for 1905, 1906, and first quarter of 1907. Cases of pseudoleukemia and Hodgkin's disease treated with Roentgen irradiation have been reported by Pusey,[130] Childs,[131] Dunn,[132] Hett,[133] Williams,[134] Senn,[135] Finch,[136] Levy-Dorn,[137] Steinward,[138] and others.

Of the leukemic cases so treated nearly all showed at first a marked improvement in the blood condition as well as in the general symptoms: the leukocytes became diminished in number or nearly normal, the red blood cells increased, the spleen reduced in size, and the subjective symptoms became much better. In a few cases the treatment was negative or caused an increase in the leukocytes, or the patient died before the effects of the treatment could be determined. As the majority of the patients have been treated such a short time the ultimate results are not yet known, and no final judgment can be passed upon such cases. It is, however, very significant that some of the earlier patients reported as cured or greatly improved have since died, while in others the improvement has been only temporary. The patients dying have shown symptoms strongly suggesting an intoxication.

Of the actual effects of Roentgen-ray irradiation upon the patho-

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[121] *Berliner klinische Wochenschrift, 1904.*
[122] *Münchener medizinische Wochenschrift, 1904.*
[123] Cited by Schenck (102).
[124] *Münchener medizinische Wochenschrift, 1904.*
[125] *Deutsche medizinische Wochenschift, 1904.*
[126] *Lancet, 1905.*
[127] *Münchener medizinische Wochenschrift, 1905.*
[128] Ibidem.
[129] Ibidem.
[130] *Journal of the American Medical Association, 1902.*
[131] *Medical News, 1903.*
[132] *American Practitioner and News, 1902.*
[133] *Dominion Medical Monthly, 1902.*
[134] *Röntgen Rays, 1902.*
[135] *New York Medical Journal, 1903.*
[136] *Medical Record, 1904.*
[137] *Berliner klinische Wochenschrift, 1904.*
[138] *Journal of the American Medical Association, 1904.*

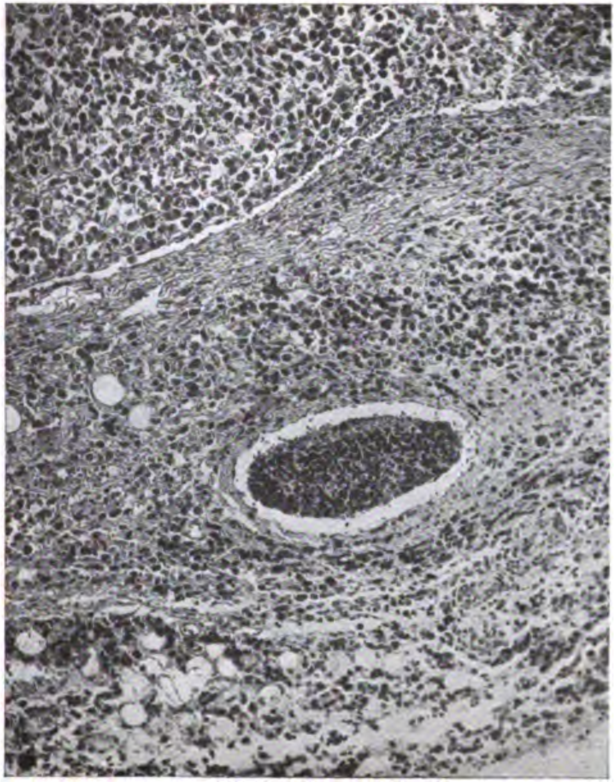

Figure XXIII.—Cervical gland from case of lymphatic leukemia, showing sarcomatous proliferation through the capsule and into the surrounding tissue.

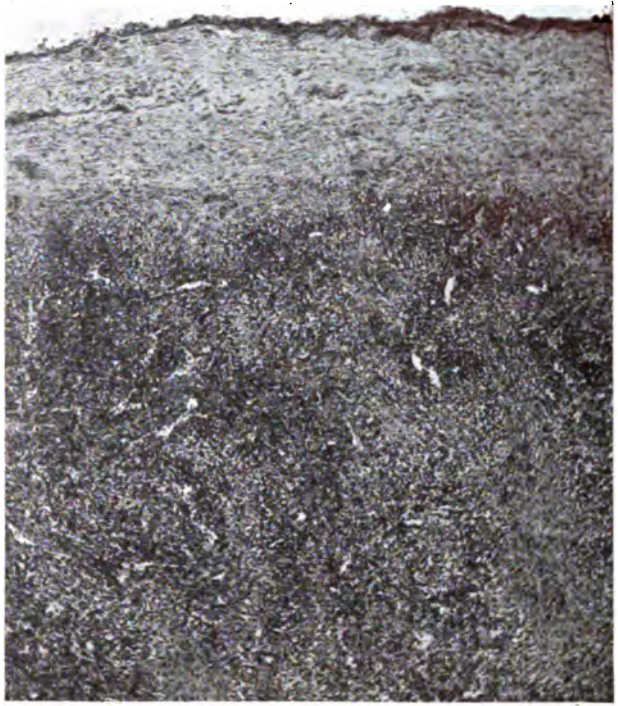

Figure XXIV.—Spleen of Case I, myeloid leukemia. Reported as cured; shows marked fibrosis.

logy of leukemia we as yet know little or nothing. Theoretically from Heineke's work we should regard the destruction of the white cells and the exhaustion of the white-cell forming function as the explanation of the improvement seen clinically, but up to the present time the autopsy material of cases of leukemia dying after Roentgen irradiation has not been studied, and we are ignorant of the exact changes produced during the treatment, and are wholly in the dark as to whether the essential disease-process is still active or has actually ceased.

I have been so fortunate as to have had the opportunity of studying the autopsy material from four cases of leukemia (three myelemic, one lymphemic), and one case of Hodgkin's disease treated by Roentgen irradiation. The clinical aspect of these cases will not be considered at this time, inasmuch as two of them were reported elsewhere from the clinical side, and the third case will be later. I shall consider here only the pathology of the spleen, lymph-glands, and bone-marrow from the cases with especial reference to any changes in the pathologic picture of leukemia due to the Roentgen-ray treatment, and shall attempt to ascertain the nature of the improvement seen clinically. The descriptions of the cases have been made as concise as possible.

CASE I.—Patient of Doctors Brown and Jack, Decatur, Illinois.[90] Male, aged thirty years. Myeloid leukemia. Leukocytes 800,000, red blood cells 2,500,000. Spleen enormously enlarged. Splenic region exposed to Roentgen rays twice a week for two months, with improvement in a month's time as shown by decreased size of spleen, lessened number of leukocytes, et cetera. Daily treatments were then given for seven months with great improvement. The patient remained fairly well for six months, although the leukocytes were high and showed a high percentage of myelocytes. Treatments were again begun (for seven weeks) but the patient gradually became worse and finally developed symptoms of a severe intoxication, resembling typhoid fever. This lasted two weeks, when he died sixteen months after the first examination.

The autopsy was performed by Doctor Jack, and the material fixed in formaldehyde and sent to me for microscopic examination. Owing to conditions no bone-marrow could be obtained. Paraffin imbedding, ordinary stains.

Pathology.—Sections of the lungs, liver, pancreas, large and small intestine showed atrophy, chronic passive congestion, and slight parenchymatous degeneration, but no evidences of a leukemic condition. There was no increase of white cells in the blood-vessels, although the monuclear forms seemed relatively increased to some extent. No infiltrations of the connective-tissue were found anywhere. The spleen showed a marked fibroid and endothelial hyperplasia of the pulp resembling that seen in some cases of splenic anemia. The small lymphocytes were very few, those of the large lymphocytic type more

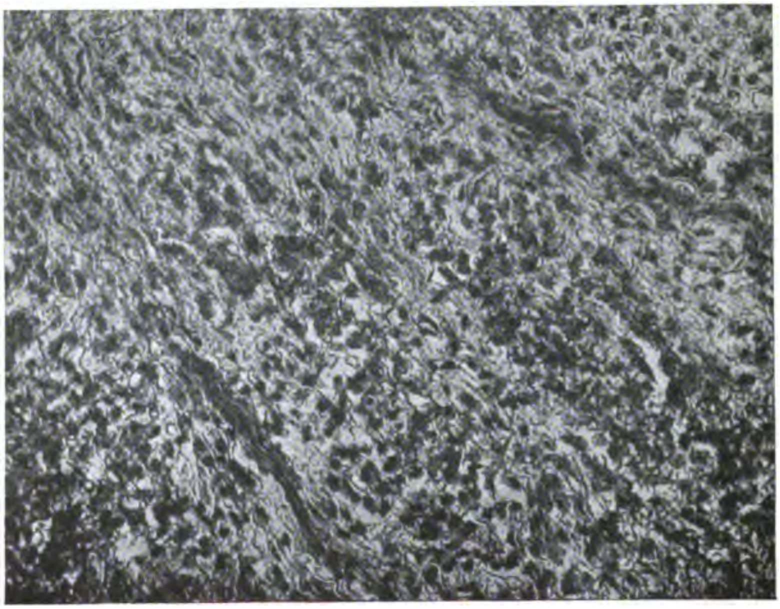

Figure XXV.—High-power view of the same spleen as Figure XXIV, showing fibrosis.

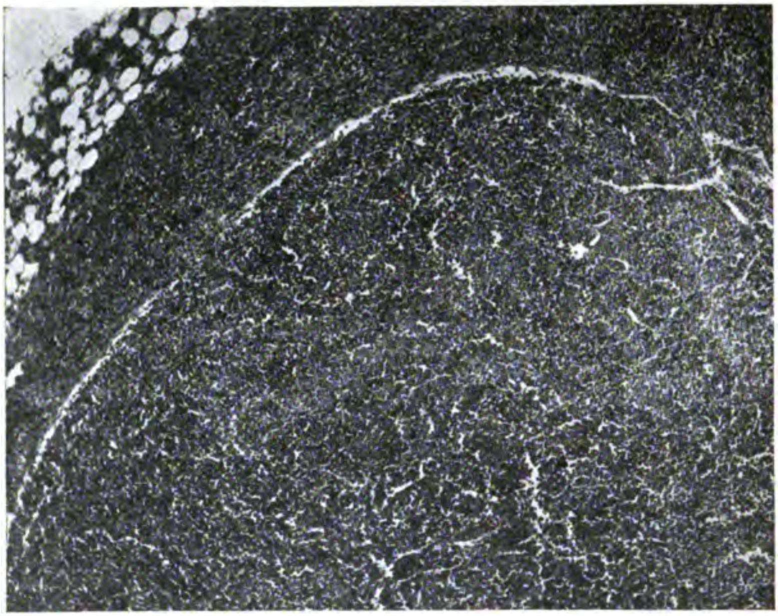

Figure XXVI.—Lymph gland of Case I, myeloid leukemia, reported as cured by *x*-ray exposures; shows lymphoid hyperplasia and infiltration of capsule and surrounding tissues.

numerous. Very few eosinophiles were present and no myeloid changes. There was no increase of white cells in the splenic vessels. The condition of leukemia could not be diagnosed from the spleen.

The retroperitoneal lymph-glands showed a marked lymphoid hyperplasia resembling that of lymphatic leukemia or certain forms of lymphosarcoma. The entire gland presented a uniform lymphoid structure with no division into cortical and medullary portions. There were no germ centers, and no sinuses could be made out. The capsule was infiltrated with cells of the same type as those constituting the body of the gland and this infiltration extended out into the surrounding fat tissue. No myeloid changes were found, and few eosinophilic cells. Numerous cells of the large lymphocytic type were scattered throughout the gland. There was no increase of leukocytes in the blood-vessels.

The kidneys presented a most marked calcification, involving chiefly the convoluted tubules, the cells lining the tubules being necrotic. Localized inflammatory changes were scattered throughout the cortex. The calcification was of remarkable extent and resembled that seen after some of the intoxications (mercuric chloride, chromates, et cetera).

Summary.—The only evidence of leukemic disease in the lymphoid hyperplasia of the lymph-glands. As there is no leukocytosis in the vessels the pathologic picture is that of an aleukemic lymphocytoma or a lymphosarcoma. We are, therefore, justified in believing that the Roentgen-ray treatment has resolved the leukemic condition into an aleukemic state, and that the essential disease-process (hyperplasia of leukoblastic tissue) is still active and that the condition is not cured. The destruction of white cells by the irradiation has led to an exhaustion of the cells producing them—hence the picture presented. The remarkable condition of the kidneys may be interpreted as an evidence of an intoxication—the poison probably arising from the disintegration of great numbers of leukocytes during the Roentgen-ray treatment.

CASE II.—Patient of Doctors Grosh and Stone, Toledo, Ohio,[98] Male, aged forty-four years; had myeloid leukemia for two years; great enlargement of spleen; leukocytes 226,250. He was given Roentgen-ray treatment for about six weeks with a medium tube, at a distance of six to eight inches. Exposures lasted five minutes. Given over sternum, spleen, and epiphyses. In six weeks the leukocytes dropped to 10,600, myelocytes from fifty-two to two per cent, general symptoms much improved, spleen distinctly reduced in size. He suddenly developed collapse and signs of an intoxication, and died in a few days. Autopsy by Doctors Grosh and Stone. Characteristic gross signs of myeloid leukemia. Material furnished me from all organs and bone-marrow, imbedded in paraffin.

Pathology.—All the organs and tissues presented the characteristic microscopic picture of a myeloid leukemia. The vessels were filled with white cells, mostly mononuclears, and the connective-tissue of all organs showed a leukocytic infiltration. Myelocytes and mononuclear eosinophiles were found in the vessels. The spleen had the characteristic hyperplasia of a myeloid leukemia, but contained perhaps more disintegrating cells than is usual. There are numerous infarcts throughout the pulp. The fibroid and endothelial hyperplasia was like that of ordinary myeloid leukemia. No follicles were present, and about the sites of these there was an increased endothelial proliferation. The bone-marrow presented the picture of a myeloid leukemia. No changes attributable to the irradiation could be found, with the possible exception of the large number of degenerating leukocytes. Throughout all of the organs and tissues the blood-vessels contained great numbers of white cells, and the impression is gained that the number in the circulation at time of death must have been much increased over that of the last count. The kidney showed some parenchymatous degeneration and local areas of inflammation, but no calcification.

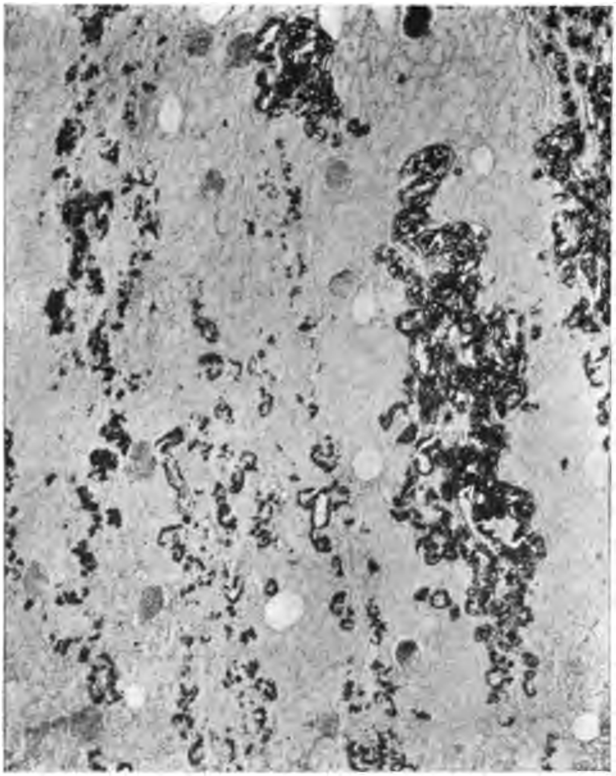

Figure XXVII.—Kidney of the same case as Figure XXVI, showing deposits of lime-salts in the tubules.

Summary.—The picture presented by this case is that of a straight-forward case of myeloid leukemia without any changes attributable with certainty to the Roentgen-ray treatment. The kidney condition did not resemble that of Case I. Assuming that the renal changes in that case were the result of excretory poisoning from the products of cell-destruction by the Roentgen rays, the absence of such changes in the second case might be explained by the shorter period of treatment and the less destruction obtained.

CASE III.—Clinic of Doctor Dock, University Hospital, Ann Arbor, Michigan. Woman, aged about forty-five years; lymphatic leukemia. Great enlargement of all lymphatic glands, particularly cervical and axillary; leukocytes 40,000 to 60,000, chiefly small mononuclears. Given Roentgen-ray treatment every other day, ten minutes each to the cervical and axillary region, for thirty treatments. Inguinal regions also for nineteen treatments. Medium tube, eight-inch distance. Skin became very much pigmented, no burn. Glands in neck and axillary region became much reduced in size, some diminution of leukocytes at first, followed later by a rise. General condition at first somewhat improved, later worse and died rather suddenly with symptoms of intoxication. Autopsy performed by Doctor Warthin.

Pathology.—The right cervical glands were imbedded in dense fibrous tissue. Some of the glands were very large, medullary, hemorrhagic; others were very small and caseous with greatly thickened capsules. The necrotic glands had rough surfaces due to the large numbers of cholesterin plates contained in the caseous mass. The glands in the left cervical region were larger and softer, and contained fewer caseous areas. Retroperitoneal glands were enormously enlarged forming a thick tumor mass in front of the vertebræ, glands fused together, very soft, hemorrhagic, showed infiltration into surrounding tissues. Bone-marrow not pathologic to naked eye. Liver showed infiltration of Glisson's islands. Spleen large, soft.

Microscopy.—The lymph-glands presented a picture suggesting that of Hodgkin's disease, but more atypical. The capsules of the glands were infiltrated and the infiltration extended into the surrounding tissues for a long distance. There were few cells of small lymphocytic type in the glands, the main mass being made up of very atypical cells resembling endothelioid cells. In the retroperitoneal masses the picture is that of a sarcoma infiltrating the surrounding tissues. All of the organs, particularly the liver, showed infiltrations of cells similar to those found in the glands; in the spleen such cells are sometimes arranged in whorls at the sites of the follicles. Numerous atypical mitroses and giant-cells were found throughout. Few cells showing eosinophilic granulation were found, but throughout the glands there were many cells with deeply-staining nuclei and red-staining protoplasm. The bone-marrow showed the same structure as the lymph-glands. All the blood-vessels showed an increase of white cells, mostly lymphocytes. The microscopic picture is a combination of lymphatic leukemia and Hodgkin's disease, the latter so atypical or malignant in character as to assume a sarcomatous nature. The kidneys were full of casts of lime-salts (chalk-infarct), and showed slight degenerative changes.

Effects of Irradiation.—In the regions exposed to the Roentgen rays glands in all stages of fatty degeneration, vacuolation, simple necrosis, and caseation were found. Some were completely caseous, the dead material being contained within a capsule showing great fibroblastic thickening and infiltration. In many necrotic glands there was a new growth of tissue outside of the capsule and infiltrating the surrounding tissues after the manner of a sarcoma. The necrotic areas were filled with cholesterin plates. The neighboring blood-vessels showed greatly thickened walls and contracted lumina. The degenerative changes were confined to the regions undergoing treatment.

Summary.—The picture of a lymphatic leukemia combined with the histologic picture of Hodgkin's disease makes this case of special interest. The immediate effect of the treatment was to cause in the diseased glands a fatty degeneration and necrosis of the atypical cells forming the gland. Such necrosis was usually followed by a new growth about the capsule or into the neighboring fat tissue, giving rise to the appearance of a sarcomatous infiltration. In so far as the presence of lymphocytes in the vessels is concerned the leukemic condition had not been affected; on the other hand the very atypical character of the lymph-gland tissue gives foundation for the belief that the condition was assuming a more malignant type and growing like a malignant neoplasm. The irradiation had caused a local destruction in the diseased glands, but had not affected the essential disease-process favorably; in fact, it becomes an open question if the treatment is not at the bottom of the more neoplastic and malignant mode of growth. The presence of a calcium phosphate infarct of the kidneys may be explained as an evidence of the excretion of the waste-products of cell destruction. The action of the *x*-rays in this case can, therefore, hardly be regarded as exercising a favorable influence on the course of the disease.

CASE IV.—Patient from Doctor Dock's clinic. Male, aged forty-nine, myelemia. White cells 250,000 to 450,000. Treated systematically for over a year by Roentgen irradiation. Number of white cells at first increased, later showed marked diminution. Size of spleen but little affected. General condition apparently improved. Returned after four months absence from the hospital, complaining of severe pain in left side and profuse sweating. Died three days after of progressive weakness.

Pathology.—Autopsy showed the cause of death to be hemorrhage from a ruptured artery in the spleen, a large blood clot surrounding the upper pole of the spleen. The microscopic examination showed extensive areas of necrosis in the spleen, probably large anemic infarcts, the ruptured artery lying at the border of one of these areas. The kidneys showed cloudy swelling and necrosis of the epithelium of the tubules with large casts of lime-salts blocking the straight tubules. Lime-salts were also deposited in the necrosed epithelium. The essential picture of leukemia otherwise was not changed.

CASE V.—Case of Hodgkin's disease from Doctor Dock's clinic. Male, aged sixty-four, typical clinical picture of Hodgkin's with atypical fever. Given ten treatments of Roentgen irradiation over splenic region and the areas of glandular enlargement. During this time had daily chills with temperature running 102°-104°. Treatment discontinued but glands became decidedly smaller. Small gland removed for microscopic examination showed typical Hodgkin's of the endothelioid type. Patient died shortly after returning home. Autopsy by Doctor Freund.

Pathology.—Glands were much smaller than when patient was first seen. Spleen moderately enlarged. The microscopic examination showed areas of necrosis and hyaline degeneration of the lymph glands associated with great increase of stroma. The changes in liver, spleen and bone-marrow were those characteristic of Hodgkin's. Necrosis and degeneration of the renal epithelium were present in a marked degree. Numerous casts of lime-salts occurred in the straight tubules.

CONCLUSIONS.

(1) Heineke's work is confirmed and extended.

(2) The experimental work proves that the Roentgen rays have a selective action on lymphoid, myeloid and epithelioid cells, causing nuclear disintegration, fatty degeneration, and necrosis, which may be followed by secondary fibroblastic or endothelial proliferation.

(3) In small animals a very short exposure may cause nearly as marked changes as much longer exposures, or the changes may be slight, or in direct proportion to the degree of exposure. Sex, age, species, and individuals are also factors in determining the effect of Roentgen-ray exposures. White rats are more sensitive than white mice, male rats apparently more so than females, young ones more so than old ones, and the individual resistance also varies.

(4) Exposures of five hours or more kill mice, rats, and young rabbits, and guinea-pigs in from two to ten days. The symptoms leading to death are uniform and characteristic, and are probably to be interpreted as an intoxication resulting from the disintegration of cell-proteid. The greater the destruction of lymphoid tissue, the more marked the symptoms of intoxication.

(5) By prolonged exposures practically all the lymphoid tissue of the spleen may be destroyed.

(6) The destruction of lymphoid tissue is always more marked in the spleen than in the lymph-glands or bone-marrow. Exposures

producing the appearance of chromatin dust in the spleen affect the mesenteric glands to a less degree. This fact may be explained on the assumption that the white cells in the spleen are in a more unstable condition.

(7) The cells chiefly affected by the Roentgen rays are the young forms, the small and large lymphocytes, and the myelocytes. These cells are destroyed in greater numbers than the polymorphonuclear leukocytes.

(8) Regeneration of lymphoid tissue is slow after prolonged or repeated exposures, but more so in the case of the former. The changes in the large epithelioid cells in the follicles in intense exposures may explain the slow regeneration in those cases.

(9) The therapeutic application of Roentgen irradiation to leukemia and pseudoleukemia finds a pathologic basis in the selective action which the rays have for cells of the lymphocytic and myelocytic types and for their parent cells. The improvement noted in the majority of cases so treated is due to the removal of leukocytes from the general circulation and from the spleen and other organs where they collect, and to a delayed production of new cells. Regarding the leukocytes in leukemia as atypical and analogous to tumor cells it may be assumed that they show less resistance to the x-rays than do normal leukocytes.

(10) It is extremely doubtful if the essential disease-process is affected to the point of a cure. The leukemic condition may be resolved into an aleukemic one or it may even assume the type of a sarcoma. The latter event is more likely to happen in the lymphemic form of leukemia.

(11) The destruction of enormous numbers of leukocytes in the circulation by means of Roentgen-ray treatment may in itself be dangerous. From the disintegrating cells poisons may be formed and these may cause a fatal intoxication. The symptoms in the animals killed by exposure strongly suggest a proteid poison (ptomain) acting chiefly upon the nervous system. The involvement of the kidneys by excreted poisons must also be borne in mind.

(12) Based upon these studies the therapeutic use of Roentgen rays in leukemia seems of doubtful value or even dangerous. Careful clinical and pathologic studies will be necessary to establish the fact of a positive cure in any case. The problem resolves itself into this: How much of the abnormal leukocyte-forming tissue in the bone-marrow, spleen, or lymph-glands can be destroyed by Roentgen rays before the patient succumbs to the disease or to the treatment? In very early cases when the leukoblastic changes are perhaps more localized it is possible that a cure might be effected; in the ordinary clinical case the outlook would appear less favorable. The hopelessness of the disease, however, should in itself be a sufficient reason for investigating this question to the fullest.

FINAL CONCLUSION.

The above conclusions written two years ago have been allowed to stand in their original form. An analysis of the clinical reports of the cases of leukemia treated by Roentgen irradiation during these two years bears out fully the view that the treatment does not affect the essential disease-process. It has been definitely shown that in myelemia the size of the spleen may be diminished, the white cell count and relative proportion brought back to normal and the general conditions improved. Such an improvement is most marked in the cases seen early in their course. In the case of lymphatic leukemia the white cells may be decreased in number but the relative proportion is not restored, the spleen and lymph-glands diminished in size and the general condition temporarily improved. A longer and more vigorous treatment is necessary in this form than in the case of myeloid leukemia.

In both forms the first change noted is usually an improvement in the general condition. The white-cell count may temporarily rise, and then begin to fall. Later the spleen and lymph-glands may become smaller. Recurrence of symptoms eventually follows, and in no case observed for some time has a cure been seen. There can be little doubt, however, that the treatment in some cases prolongs the life of the patient by a period varying from one to two years.

The effect of the treatment by Roentgen irradiation is a purely destructive action upon the white-cell-forming tissues. This action, however, is only a temporary one, both in the case of the normal blood-forming organs and in those showing leukemia changes. The action of arsenic is likewise destructive, but is of much less intensity than that of Roentgen rays, and much more temporary. The prolonged destructive action seen in cases treated by the Roentgen rays is thought to be the result of a leukolytic toxin formed in the serum of the leukemic patient. The greatest destructive action, therefore, would result from a coincident use of both arsenic and the rays, and such a combination is advised by a number of writers.

The dangers of this destructive action must, however, be borne in mind, and the treatment carefully carried out. The severe symptoms of intoxication following prolonged or repeated exposures, leading in some cases to sudden death, the production of secondary changes in the kidneys, hemorrhages from the spleen, et cetera, are the possible dangers of the treatment. But with the realization that the treatment is only symptomatic and not specific, that it is destructive and attended by various dangers, the collected clinical experience at the present time would still give it a place in the therapeutics of leukemia as an agent whereby a year or two of life may be given to the leukemic patient.

NOTE.—My thanks are due Doctors Brown, Jack, Grosh, and Stone for the opportunity of studying their autopsy material, and to Doctor W. J. Herdman and Mr. V. J. Willey for the utilization of the *x*-ray laboratory of the University Hospital.

[THE END.]

THE MECHANICAL AND CHEMICAL EFFECT OF MILK ON THE HUMAN.

ARTHUR E. GUE, M. D.

MILK is the normal secretion of the mammary glands of all mammals, and the milk of all mammals has a similar composition, consisting of fat, sugar, albuminoids, mineral constituents, and small quantities of other compounds. The milk of the cow has been studied in greater detail than that of any other animal on account of the extended use of this animal's milk and the products derived from it as human food. Our knowledge of the chemical composition of cow's milk is indeed very complete, while studies, more or less incomplete, have been made of the milk yielded by woman, the goat, the ass, the mare, and the sheep. While there may exist a wide difference in the sustaining qualities of the mammary secretion of different animals as applied to man, this difference will be found not only in the chemical properties of the milk, as given by chemists, but we will also add that there is a mechanical effect which milk produces on the human tissues that must not be lost sight of. There is likewise a vitality which the animal has which produces the milk that is essential. This vitality is marked by certain characteristics which all are important and to which we will refer later. Briefly, our scheme is to show the mechanical and chemical effect of milk on the human, and why the Holstein-Friesian cow is the food-producing ideal.

While the chemistry of the different constituents of milk is only in its infancy and it may seem premature to discuss such at this time, still for the purpose of this paper it will be quite necessary to hint at some of the obscure truths. A word first as to the individual constituents of milk.

The fat, for instance, is of peculiar and complex composition. It differs from other fats in that it contains compound glycerin. It exists in milk in small globules and each globule is surrounded by a true membrane. Now this last is a proven fact, and I would ask you not to debate it for the present but bear it in mind for future use in the study of this paper.

The sugar in milk is also of peculiar nature. That of the cow's milk is called "lactose," or, more commonly, sugar of milk. It is generally assumed that all milk contains the same sugar, and while it may be so, it is a fact that the sugar of one animal seems to have a property not found in that of another; for instance, the sugar of the milk of the mare has the property of easily undergoing alcoholic fermentation, a property not possessed by the sugar found in cow's milk. So also is it a fact, as stated by Carter, that the sugar of the human milk is not identical with that of the milk of the cow though the properties seem to be the same. Again, we find that milk sugar exists in several modifications which are distinguished from each other chiefly by their behavior under certain atmosphere, even polarized light being sufficient to break up milk sugar into a modification of itself.

Our present knowledge of the albuminoids of milk is far from complete, though much work has been done on the subject. This is due to the fact that it is extremely difficult to obtain these compounds in anything like a state of purity. The milk albuminoids are bodies of complex composition containing carbon, oxygen, nitrogen, hydrogen, phosphorous, and sulphur. The way in which these elements are combined is not known, but that they exist differently in the milk of different animals is a fact borne out clinically rather than chemically. It is this fact that undoubtedly suggested the comprehensive term "vitality" to Professor Carlyle as related by Mr. Cortelyou in his address of the twentieth annual meeting of the Holstein-Friesian Association. It was this fact that Professor Holt had in mind when he said that in infant feeding there is a difference among the different breeds. It may be slight but that difference is shown on the delicate human organization, and to my mind he must have had the Dutch cow in mind when he said, select a large, strong, healthy cow and the little difference will not be noticed, and then followed this injunction by cautioning the student concerning the fact that tuberculosis is more common in the Jersey than in any other breed. Taking up once more the albuminoids, we repeat that they differ in the milk of different animals; they may be divided broadly into two classes, those like the cow and the goat which give a curd on the addition of an acid, and those like the human and the mare which do not. Now, the curd found in the cow is composed of casein, which is composed in the main of earthy phosphates, the presence or absence of which causes the difference in the albuminoids of the two classes. Besides casein there exists in all milks a second albuminoid called albumin. This differs from the casein by not being precipitated by acids, but will be coagulated by heat. There are other albuminoids described in milk, but enough has been said excepting to allow me to reiterate that the elements found in the albuminoids vary in different animals and this without disturbing the general complex make-up of the milk.

Henkel and Bechamp are about the only authority on salts. They admit the presence of potassium, calcium, chlorides, phosphates and magnesium. Henkel has gone so far as to find an organic acid (described as citric acid) which he has found at times in some samples of milk, and while this result is not universally accepted, for the sake of future reference, please keep this point in mind.

If you can only see with me that the atoms composing the different elements of which we have been talking are so delicately arranged, and the molecules built up in so complex a manner that they cannot be disturbed, you would then understand how even a slight change in some one element would make a vast change in the whole. This is to such an extent that in the large percentage of cases where the milk is modified the child or invalid does not thrive. By some writers it is said that the reason that the milk of Jerseys does not agree with subjects of low vitality is that it is so rich in fat that when in combination with the digestive ferments it produces a substance that is absolutely toxic. This I feel is not quite true. The difference we will find to be a physiological and mechanical derangement, physiological in the fact that it is impossible for the large membranous-covered fat globule of the Jersey to crowd through the microscopical cells of the digestive organs which they do when assimilation is perfect, and if forced will produce an active mechanical irritation resulting in numerous disturbances of the alimentary tract, while with the Holstein's milk the fat globules are so small that they readily pass by endosmosis through the cellular tissue. Professor Holt, in his summary from figures compiled from sixty thousand analyses collected by Mr. Gordon, of the Walker-Gordon Milk Laboratories, made from the American grades and common natives says, leaving out the Jerseys, the average of the different breeds of cows are remarkably uniform in their total solids.

Now, if it is a fact that there is little difference in the component parts between the Holstein and other dairy breeds, wherein are we to lay claim to this superior vitality in the Dutch milk? In two ways. First, the chemical combination of all the elements of the milk. In one breed this combination will produce one result, while in another breed these elements combined will produce entirely different results. In other words, in one breed these elements are happily combined, while in others these same elements are opposed. How is this so? Well, just as one manufacturing pharmacist will make a certain preparation composed of two or more ingredients that, when given to the body, will produce good results, while another pharmacist will analyze the product and prepare, as he thinks, the same, yet the result on the body is disastrous. Why? Because there is that lack of what is known in medicine as a happy combination. Now, so it is between the different breeds. It would be so easy—although all the elements are present in a certain milk—there might be that lack of harmony which would change the final sum. For instance, diamonds and charcoal are chemically the same, but show a gross difference in the completed substance.

Now, what would produce this lack of harmony in the different elements of milk in the several breeds (another claim to superiority) that is, the breed itself? The quality in a breed is one of the most important factors, and that which influences most of all these factors is, first, the duration of the purity of breeding without admixture of alien blood, and second, the uniformity of type, and the inherent vigor of that type. It is doubtful if any breed of cattle has been bred pure for a longer period than the Holstein, and the inherent vigor of the breed is indisputable, it matters little with what breed or type a Holstein bull is mated the offspring is almost sure to resemble the sire markedly in characteristic, particularly so in color. Now, I speak of this prepotency because it is the vital factor in holding all of the delicate arrangement of the molecular formation of milk in happy relationship! On the other hand, take a breed of delicate constitution, nervous and predisposed to all outside influences,—are they not more apt to cause an unbalanced condition of all those elements that go to make up the milk. If this is not so then how is one to explain the fact that hospital patients (ranging from infancy to old age) fed on the milk of a certain breed, no matter how diluted or modified, failed to thrive, but when changed to the milk of the Holstein-Friesan a marked change was noticeable. I do not think I am presuming too much when I say that it would not be unreasonable to expect that in two different milking breeds where all the elements of this great chemical combination are practically in the same proportion, one ingredient not up to standard (low grade of phosphorus or poor sulphur for instance), would sacrifice the whole. In other words the difference in the digestibility of one cow's milk over another is dependent upon the difference in their molecular arrangement and not whether they are rich in fat or not.

The time is not far distant when the boards of health and city governments will insist not on a high grade of fat, but on a high grade of solids, a fine molecular combination and few bacteria, as most hospitals do now. Right here, it might be patent to add, that a Walker-Gordon representative replied in answer to my question—If left with no other means of feeding infants than raw cow's milk, what breed would you choose? "Holstein, because it comes nearer a balanced ration than any other."

Detroit, Michigan, 271 Woodward Avenue.

ORIGINAL ABSTRACTS.

MEDICINE.

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ACUTE DILATATION OF THE STOMACH.

Lewis A. Conner (*American Journal of Medical Sciences,* March, 1907) has made a full study of this interesting condition in its relation to mesenteric obstruction of the duodenum. His conclusions based on one hundred and two cases, are as follows: "Acute dilatation of the stomach is a disease of considerable clinical importance and is deserving of wider recognition. It develops under a great variety of conditions, but is especially frequent after operations with general anesthesia. In a majority of the cases there has been an associated dilatation of the duodenum. The mechanism of acute gastric dilatation is not yet clearly understood, but in a large proportion of cases (perhaps one-half) the dilatation is associated with, and seems to result from, some form of obstruction in the duodenum. Much the commonest cause of such duodenal obstruction is the constriction of the lower end of the duodenum between the root of the mesentery, which crosses in front of it, and the vertebral column. Such constriction can occur only when the mesenteric root, with the superior mesenteric artery which runs in it, is stretched tightly across the duodenum; and this is possible, apparently, only when traction is exerted by the small intestine hanging over the brim of the pelvis. The development of mesenteric constriction is favored, therefore, by whatever facilitates the entrance of the small intestine into the true pelvis (dorsal decubitus, a mesentery of suitable length, an empty and collapsed state of the gut, et cetera), and whatever renders the duodenum more liable to compression (increased lordosis of the lumbar vertebræ, low position of the duodenum, et cetera). Great dilatation of the stomach would doubtless increase the liability to mesenteric obstruction by crowding the intestines into the pelvis, and would tend, by preventing the escape of the gut from the pelvis, to render such obstruction, when once formed, more complete and permanent. Whether the dilatation of the stomach or the mesenteric obstruction of the duodenum constitutes, usually, the first step in the vicious circle by which both conditions are made worse is still uncertain, but there is little doubt that in some cases, at least, the duodenal obstruction is primary. The symptoms and signs of acute gastric dilatation are usually so distinct that the diagnosis should not be difficult if the possibility of such occurrence be but remembered. In spite of the high mortality (seventy-two per cent) among the reported cases, there is much evidence to show that the disease can usually be controlled and cured if the diagnosis be made and suitable treatment begun before complete collapse of the patient has occurred." G. D.

SURGERY.

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ETHER NARCOSIS BY RECTUM.

FOLLOWING Cunningham's method of producing ether narcosis by rectum, Stucky reports (*American Journal of Surgery*, September, 1906) and makes comments. He lays great stress upon the preparation of the patient, requiring a restricted diet, largely of liquids, during forty-eight hours preceding the operation. "Five grains each of calomel, salol and sodium bicarbonate are given, followed in eight hours by half an ounce of castor oil. The night before the operation two ounces of saturated solution of magnesium sulphate are administered, following in the morning by a large soapsuds enema. Just before going to the operating table another enema is given." The ether breakfast, "four to six hours before the operation, consisted of beef tea or milk and a slice of toast."

The author used Cunningham's apparatus, consisting of a bottle capable of holding about three pints, which was two-thirds filled with ether. Afferent and efferent tubes were applied, the former connecting with an air bulb, the latter with a stiff rectal tube. The ether bottle was placed in a water bath at a temperature of 80° to 90° Fahrenheit. The patient lies on his back with legs slightly flexed. The ether gas is forced into the rectum and an effort made to expel rectal gases. The breath becomes ether laden in from one to five minutes after the administration is begun.

The advantages claimed are notable in operations upon the head or neck, and include rapid anesthesia without suffocation, with less excitement, less bronchial secretion and less vomiting than by the inhalation method. He reports no diarrhea, bloody stools, or rectal irritation, due to better preparation of patient, better quality of ether and improved method of administration. F. B. W.

GYNECOLOGY.

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FORMERLY FIRST ASSISTANT IN GYNECOLOGY AND OBSTETRICS IN THE UNIVERSITY OF MICHIGAN.

ANTERIOR VAGINAL CELIOTOMY: ITS TECHNIC, INDICATIONS, AND LIMITATIONS.

BANDLER (*American Journal of Obstetrics,* Volume LV, Number I), after a general consideration of the subject gives, as his own preference, the following indications and contraindications for anterior vaginal celiotomy: (1) Vaginal celiotomy may be used for retrodisplacements of the uterus to be corrected by vaginal fixations of the uterus, vaginal shortening or fixation of the round ligaments. (2) For the correction of cystocele to be treated by the method of vaginal suspension or fixation of the uterus. (4) Prolapse of a large uterus, an amputation of the cervix and perineorrhaphy to accompany vaginal fixation. (5) Exploratory celiotomy for certain nontangible pelvic conditions. (6) Conservative or minor operations on the adnexa with only slight adhesions especially if at the same time retroflexion or retroversion plus descent or cystocele call for vaginal suspension. (7) For the production of artificial sterility by excision of parts of the tubes. (8) For the removal of small movable tumors of the ovary or tube. (9) Small fibroids of the uterus, suitable for myomectomy. (10) Hysterectomy for uterine disease in case it is not essential to remove a wide area of broad ligament, or hysterectomy for double pyosalpinx, when there is reason for removing a chronically inflamed uterus.

The choice of vaginal operation is debatable: (1) In certain cases of ectopic gestation. (2) For the removal of not too large cystic tumors.

Vaginal celiotomy is contraindicated: (1) In the presence of a pregnant uterus or shortly after labor or abortion. (2) If a previous vaginal section or separation of the bladder has been done. (3) If it is desirable to inspect the appendix. (4) If the gallbladder or other abdominal organs are to be explored. (5) When the vagina is so small that incision of the perineum would be necessary. (6) In the event of tumors fixed anterolaterally to the uterus. (7) In cases where injury to the uterus in inflammatory disease might cause extension to the other side. (8) When the adnexa are fixed to the lateral pelvic walls. (9) When the uterus is adherent posteriorly. (10) When there are tumors fixed to the posterior uterine wall. (11) With ovarian tumors with adhesions or twisted pedicle. (12) In case of large solid ovarian tumors or dermoid cysts. (13) Intraligamentous tumors. (14) In most cases of ectopic gestation. (15) In dealing with large irregular fibroids of the uterus. C. G. P.

Jackson, Michigan, The Colony, 258 West Main Street.

OBSTETRICS.

WILLIAM HORACE MORLEY, PH. B., M. D.
LATE DEMONSTRATOR OF OBSTETRICS AND GYNECOLOGY IN THE UNIVERSITY OF MICHIGAN.
AND
ROLLAND PARMETER, B. S., M. D.

TUMORS OF THE PELVIS DURING PREGNANCY AND THEIR TREATMENT.

V. FRAUQNE (*Prager med. Wochenschrift*, 1906, Number XL) believes in completely removing ovarian tumors at once. When not necessary at time of the delivery, at the latest at the close of the lying-in period. A prolonged delay is undesirable. The danger of twisted pedicle in ovarian cysts or of inflammatory adhesions to neighboring organs as the intestines should always be borne in mind. When the trouble is located on the right side, for example, prolonged and difficult operations can be avoided by use of the vaginal route. The feasibility of this standpoint is taken from the author's observations in numerous cases, among them a case of a vaginal öophorectomy in the seventh month of pregnancy without its interruption. Worthy of note is also a case of a vaginal myomectomy of a subserous fibroid in the fifth month of gestation, where from the recession of the point of attachment of the tumor a laparotomy was necessary in order to successfully control the hemorrhage. The pregnancy went to full term without interruption. The author states in general by myomata a conservative attitude is justifiable, as one should always bear in mind the danger of the introduction of abortion or miscarriage in these cases.

W. H. M.

APPENDICITIS AND PREGNANCY.

H. HENNE (*Deutsche Zeitschrift für Chirurgie*, Band LXXXII, Hefte 4-6) reports a case of this kind. The patient was in the fifth month of pregnancy and had suffered for some time from enteritis. Suddenly the symptoms of an acute appendicitis developed. Thirty hours later by an operation, an enlarged appendix, completely buried in adhesions, and twisted one or more times upon itself was removed. The patient had an uneventful convalescence and was delivered of a full-term child a few months later. W. H. M.

PEDIATRICS.

ARTHUR DAVID HOLMES, C. M., M. D.

PNEUMONIA.

FENNER divides (*Pediatrics*, June, 1906) the pneumonias of childhood into broncho, lobar and interstitial varieties. The first two are very common, while the last is rather frequent but not often recognized. It should be remembered that in searching for pneumonia in the young, the region high up in the axilla must never be overlooked, and in any obscure illness pneumonia should be thought of, especially where the respiration pulse ratio departs from the normal. The onset may be quite insidious if it occurs in the course of some exhausting disease. The mortality is very much lower in lobar- than in bronchopneumonia. We must not forget that true pneumonia sometimes aborts itself, so undue credit should not be given to the treatment adopted. We have no specific which will curtail a pneumonia. The patient should be treated rather than the disease. The value of fresh air and frequent change of position cannot be overestimated.

The care of the digestion and nourishment must be anxious and constant. Flatulent distension is a serious impediment to breathing. If fever requires controlling rely on hydrotherapy and not on the coal-tar products. Local applications, such as poultices, are probably useless or actively injurious. The author relies on digitalis and strychnin, atropin, caffein and alcohol if drugs are needed, and these in proper doses and at suitable intervals, be believes will help nature to carry the patient through the danger period. He warns against the use of nauseating cough mixtures and emphasizes as strongly as possible that nature will cure many cases of pneumonia.

ORTHOPEDICS.

IRA DEAN LOREE, M.D.

FIRST ASSISTANT IN SURGERY IN THE UNIVERSITY OF MICHIGAN.

RIGID SPINE: A STUDY WITH REPORT OF FIVE CASES—AUTOPSY.

George R. Elliott, M. D., of New York (*American Journal of Orthopedics* for April, 1906). He not only reports the five cases, but reviews the literature since Virchow's work on the pathology of rigid spine. By exclusion and comparison he attempts a scientific differentiation of the diseases which have hitherto been promiscuously grouped under the above heading. His classification is as follows:

(1) Senile kyphosis.
(2) Field worker's kyphosis.
(3) Ostitis deformans of the spine.
    (a) Degenerative.
    (b) Secondary.
(4) Chronic inflammatory ankylotic rigidity.
(5) Traumatic spinal rigidity.
(6) Muscular spinal rigidity.

LARYNGOLOGY.

WILLIS SIDNEY ANDERSON, M. D.

CLINICAL PROFESSOR OF LARYNGOLOGY IN THE DETROIT COLLEGE OF MEDICINE.

SYPHILIS OF THE THROAT.

Griffin (*American Journal of Dermatology,* Volume X, Number IX) makes a plea for the more careful study of the throat lesions of syphilis. He calls attention to the value of throat lesions in the diagnosis of lues, especially in those cases where the disease has been contracted innocently. He cites a number of cases where the chancre was in the throat or on the lips, and calls attention to the fact that the eruption appears much earlier on the skin when the primary lesion is in the throat or on the lips. The author believes that not enough attention is given in our medical colleges to the subject of syphilis, and that many of the unfortunate results of this disease ought to be avoided by the prompt recognition of the condition.

CERTAIN FACTS CONCERNING THE FAUCIAL TONSILS.

Charles M. Robertson (*Journal of the American Medical Association,* November 24, 1906) gives the formation of the tonsils, the structure and relation of the tonsils, and the result of his own observations. The author believes in thoroughly dissecting out the tonsils when they are diseased, and prefers the scissors operation. He summarizes his views under the following conclusions:

(1) Eight per cent of all tonsils (232) examined were affected with primary tuberculosis.

(2) Tuberculous infection enters the tonsils through the crypts.

(3) Those crypts emptying into the supratonsillar fossa furnish seventy-five per cent of the cases of tuberculosis of the tonsil.

(4) Infection takes place in the depth of the crypt.

(5) Tonsils are the cause of general infection of the blood which may produce tuberculosis in any part of the body.

(6) Direct infection of the apex of the lung from the tonsil.

(7) Failure of operation for cervical adenitis unless the tonsil is removed.

(8) The great number of patients developing lung tuberculosis when the cervical glands are not operated on.

DERMATOLOGY.

WILLIAM FLEMING BREAKEY, M. D.
CLINICAL PROFESSOR OF DERMATOLOGY AND SYPHILOLOGY IN THE UNIVERSITY OF MICHIGAN.
AND
JAMES FLEMING BREAKEY, M. D.
ASSISTANT IN DERMATOLOGY IN THE UNIVERSITY OF MICHIGAN.

THE CAUSATIVE FACTOR IN THE PRODUCTION OF THE DERMATITIS OF GROUND ITCH (UNCINARIASIS).

In the *Journal of the American Medical Association,* Volume XLVII, Number XXI, Doctor Claude A. Smith reports experiments upon the human skin tending to prove that the dermatitis of uncinariasis is caused by something other than the mere mechanical irritation of the passage of the larvæ through the skin. Acting upon the assumption that the larvæ contain or excrete some substance irritating to the skin, efforts were made to extract this product. Large numbers of larvæ were obtained in pure culture by methods described.

(1) Over a dry mass of larvæ a small amount of absolute alcohol was poured and allowed to remain several hours.

(2) A similar though larger mass was ground in a mortar and treated in the same manner.

(3) A similar mass was treated in the same way with ether, and:

(4) Another such mass was treated with water.

The alcohol from (1) was poured over a pledget of cotton, which was applied to the wrist, covered with a small piece of rubber and bandaged on for one hour. When removed the area covered was found to be reddened in spots, with slight itching. After removing the cotton the redness diminished, and for the next twenty-four hours there were few symptoms. Then small pimples appeared and there was increased itching. On the third day there was a tendency toward vesiculation.

The subcutaneous tissue showed no evidence of the involvement. Normal conditions were restored by the sixth day.

A similar application was made with the alcohol from (2), with similar but intensified results. There was also some cutaneous thickening and enlargement and tenderness of the epitrochlear glands. The eruption had disappeared by the eighth day.

Experiments with (3) and (4) were negative, while a control of pure alcohol was also negative. From these experiments Smith concludes that the larvæ of the uncinaria Americana produce some substance irritating to the skin with a tendency to vesicle formation. The identity of this substance has not yet been demonstrated. J. F. B.

NEUROLOGY.

DAVID INGLIS, M. D.
PROFESSOR OF NERVOUS AND MENTAL DISEASES IN THE DETROIT COLLEGE OF MEDICINE
AND
IRWIN HOFFMAN NEFF, M. D.
ASSISTANT PHYSICIAN AT THE EASTERN MICHIGAN ASYLUM.

"THE PRESENT STATUS OF BRAIN SURGERY."

Starr has collected (*Jama*, September 22, 1906) data of formulated conclusions in regard to the propriety of operations on the brain in various conditions. The author's personal experience and conservative and yet concise opinions on this branch of surgery are valuable and deserving of general consideration. The article is divided into four sections, and the following partial summary can be made:

I.—SURGICAL TREATMENT OF EPILEPSY.

Only two per cent of all cases are amenable to operation, the other ninety-eight per cent presenting none of the characteristic symptoms of localized disease of the brain. In only about twenty per cent of the patients operated on have permanent cures been the terminal result. The author has seen many cases of ordinary idiopathic epilepsy, supposed to be due to a blow on the head, operated on, the results being absolutely of negative value. Operative treatment is to be considered only in cases of focal epilepsy.

II.—SURGICAL TREATMENT OF ABSCESS OF THE BRAIN.

The author states that lumbar puncture and examination of the blood for leukocytosis is an important means of differential diagnosis between meningitis and cerebral abscess. He is emphatic in his opinion that as soon as the diagnosis of cerebral abscess is made, under any circumstances it is imperative to operate.

III.—THE SURGICAL TREATMENT OF TUMORS OF THE BRAIN.

Ten per cent of tumors are open to surgical treatment. Knapp's tables are given, and Starr states that these statistics are quite in accord with his experience. He regards favorably the operation for relieving pressure by making a large opening in the skull. This is particularly beneficial for unaccessible tumors.

IV.—SURGICAL TREATMENT OF CEREBRAL HEMORRHAGE.

While supposedly surgical intervention would be limited to surface hemorrhage following contusions and fracture of the skull, it must be borne in mind that in these cases where a rapid rise of blood pressure is coincident with a slow pulse, we are justified in operating at any rate for the relief of the pressure. The author believes that cerebral hemorrhage in new-born infants may afford a field for operative measures. Starr believes that there is a field of operation in cases of surface hemorrhage, and is strongly in favor of operative interference in selected cases.

V.—SURGICAL TREATMENT OF IMBECILITY.

The author has not observed any marked improvement following operations on the skull for imbecility. He is inclined to attribute any improvement resulting to education, and believes that this result could possibly have been obtained without operation. Starr does not operate because he thinks that it is evident that in microcephalic idiocy the microcephalus is not the cause of imbecility, but that it is merely an expression of defective growth. I. H. N.

EDITORIAL COMMENT.

THE STUDY OF MEDICAL HISTORY BY AN INTERNAL MEDICINE STAFF.

NOTHING is more stimulating to the student of any subject than to become acquainted with the history of that art or science in which he is particularly interested. To have a knowledge of the Roman and old English codes is indispensable to one who would appreciate modern law. To be conversant with the works of Grecian sculptors and Italian painters gives an impetus to the zeal of modern artists. To the physician much is lost if he considers that nine-tenths of the useful medical lore of today has originated in the last generation.

Unlike most of the other professions, medicine has transmitted her heritage along the highways of the centuries, collecting from many bypaths and obscure sources some of her most valuable facts; so that today science glories not only in her present achievements but in the accumulated works and experiences of such eminent characters as Hippocrates, Galen, Vesalius, Paré, Harvey, Leuwenhoek, Sydenham, Boerhaave, Auenbrugger, Jenner, Louis, Virchow, Pasteur, and many others. To become acquainted with these masters and their teachings, to understand how they labored and struggled to establish their sound

principles, to see as they did into the realms in which we are now travelling, to learn how much is theirs, how little more is ours, only a study of the history of medicine can teach us.

With the purpose in view of stimulating to study and of cultivating a broader field of medical knowledge, Professor George Dock has spent many valuable evenings during the past winter with his graduate and undergraduate staff in studying the lives and works of some of those who have "blazed the trail." Most of the time was devoted to the career and writings of Rudolph Virchow. Beginning with the great pathologist's early life, the story of his political struggles and travels were first considered. These led into the fields of remarkable discoveries in cellular pathology with which the name of Virchow stands synonymous. A review of the life and works of a pioneer in American medicine was next undertaken. Benjamin Rush was chosen. His writings, his methods in practice, his management of some of the present-day diseases, his memorable experiences with yellow fever, and finally his own personal peculiarities and political differences were made the subject of many hours of fruitful and instructive discussion.

As the occasion suggested and the time permitted, notable events in careers of other eminent men in medicine were briefly sketched by Professor Dock. In this pleasant manner a foundation for further study of the history of medicine was afforded and a desire to come into closer touch with the masters in our profession aroused in all.

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SPECULATION CONCERNING SEX.

Notwithstanding the numerous theories which have been advanced and exploded respecting the factors influencing prenatal determination of sex, Professor Thomas, of Chicago University, ventures the hypothesis that luxurious living of parents is responsible for the production of females, whereas a diet of plain food predisposes to male offspring. He cites the fact that among country people who subsist upon plain food, male children are the rule, and that in times of war and famine,

when a dearth of food exists and the parents are subject to hardship, female offspring is less frequent. He raises the contention that luxury is productive of undeveloped offspring and cites the anthropologic classing of women midway between the infant and the adult male. This idea, which is calculated to raise a storm of protest from women of intellect, meets with the concurrence of Vogt, of Zurich, who declares that the mental apparatus of the female is embryonic in character, and that it is incapable of individual reasoning. While these deductions are indeed interesting to the speculator and perhaps satisfying to the scientist, the present intellectual status of woman and her capácity for thought and action discredit allusions to her mental deficiency. Basing his conclusions upon animal experimentation, Thury, of Geneva, ventures the assertion that should fertilization occur four days before the appearance of menstruation, the child will be female, while impregnation five or six days after termination of the menses will result in male offspring. In twenty-nine experiments made upon cattle by a Swiss farmer, control of sex seemed possible without a single failure, and Guiard is quoted as observing thirty-five cases in the human which apparently substantiated the theory of Thury.

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Leven and Barret have contributed to medical literature a rather interesting comparison of the infant and adult stomach, based upon numerous observations covering a considerable period. In the adult the pylorus only lies to the right of the median line, whereas in the infant a large part of the stomach from antrum to pylorus is here

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MINOR INTELLIGENCE.

REPORT says that the residents of Jerusalem are to erect a hospital on the Mount of Olives.

DOCTOR OSCAR LE SEURE has been appointed chief surgeon to the Michigan Central Railroad, vice Doctor Frederick W. Mann, resigned.

DOCTOR AUGUST BIER, of the University of Bonn, has been elevated to the professorship of surgery at Berlin, succeeding the late Professor von Bergmann.

DOCTOR CHRISTOPHER G. PARNALL, of Jackson, Michigan, has permanently established his offices and private laboratory in The Colony, 258 Main street, West.

INDIANAPOLIS is to have a new office building dedicated exclusively to the use of physicians and dentists. The edifice will be constructed at a cost of $100,000.

THE lower house of the New York legislature has passed a bill prohibiting the sale of cocain and all other preparations containing the drug, except in physicians' prescriptions.

DOCTOR SCHREIBER, a physician in the bubonic plague laboratory connected with the fortress of Cronstadt, Saint Petersburg, Russia, recently contracted the disease and died therefrom.

THIS year's ball given at Madison Square Garden for the benefit of Beth Israel Hospital netted nearly $20,000. The function was attended by Governor Hughes and his military staff.

THE University of California is to have a new hospital, the central building of the affiliated colleges erected some time ago by the state at a cost of $250,000, being dedicated to the purpose.

THE Committee on Public Health of the Alabama House of Representatives has voted to report favorably on the Senate measure to establish a State Sanitary Board of Live Stock Examiners.

THE Fourth Congress of the Italian Orthopedic Society will be held at Bologna, October 15, 1907. Tuberculosis of the bones will receive special attention, and a large attendance is anticipated.

DOCTOR WILLIAM Q. MARSH, chief surgeon of the Mexican Northern Railroad, with headquarters at Sierra Mojada, died recently in El Paso, Texas, after an illness of six weeks, aged fifty-two years.

DOCTOR O. ISRAEL, professor of pathologic anatomy at Berlin, and editor of *Virchow's Archives,* died recently in the German capital at the age of fifty-three. The doctor was formerly assistant to Virchow.

AN autopsy recently performed on a prisoner who died while awaiting trial for perjury in New York, disclosed the existence of a heart weighing four pounds and two ounces. The organ, said to be the largest on record, will be placed in the pathologic laboratory of Columbia University.

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LEVEN AND BARRET have contributed to medical literature a rather interesting comparison of the infant and adult stomach, based upon numerous observations covering a considerable period. In the adult the pylorus only lies to the right of the median line, whereas in the infant a large part of the stomach from antrum to pylorus is here

principles, to see as they did into the realms in which we are now travelling, to learn how much is theirs, how little more is ours, only a study of the history of medicine can teach us.

With the purpose in view of stimulating to study and of cultivating a broader field of medical knowledge, Professor George Dock has spent many valuable evenings during the past winter with his graduate and undergraduate staff in studying the lives and works of some of those who have "blazed the trail." Most of the time was devoted to the career and writings of Rudolph Virchow. Beginning with the great pathologist's early life, the story of his political struggles and travels were first considered. These led into the fields of remarkable discoveries in cellular pathology with which the name of Virchow stands synonymous. A review of the life and works of a pioneer in American medicine was next undertaken. Benjamin Rush was chosen. His writings, his methods in practice, his management of some of the present-day diseases, his memorable experiences with yellow fever, and finally his own personal peculiarities and political differences were made the subject of many hours of fruitful and instructive discussion.

As the occasion suggested and the time permitted, notable events in careers of other eminent men in medicine were briefly sketched by Professor Dock. In this pleasant manner a foundation for further study of the history of medicine was afforded and a desire to come into closer touch with the masters in our profession aroused in all.

H. A. F.

ANNOTATIONS.

THE CAUSATION OF LINGUAL CANCER.

POIRIER, discussing lingual cancer in a foreign periodical, makes the statement that the disease in most cases can be traced either to syphilis or tobacco indulgence, a combination of these factors rendering the individual far more susceptible. In thirty-two operations for lingual cancer performed by the author during five years, all were tobacco smokers, and twenty-seven were syphilitic. The conclusion is reached that the malady might well be designated "cancer of syphilitic smokers."

SPECULATION CONCERNING SEX.

NOTWITHSTANDING the numerous theories which have been advanced and exploded respecting the factors influencing prenatal determination of sex, Professor Thomas, of Chicago University, ventures the hypothesis that luxurious living of parents is responsible for the production of females, whereas a diet of plain food predisposes to male offspring. He cites the fact that among country people who subsist upon plain food, male children are the rule, and that in times of war and famine,

when a dearth of food exists and the parents are subject to hardship, female offspring is less frequent. He raises the contention that luxury is productive of undeveloped offspring and cites the anthropologic classing of women midway between the infant and the adult male. This idea, which is calculated to raise a storm of protest from women of intellect, meets with the concurrence of Vogt, of Zurich, who declares that the mental apparatus of the female is embryonic in character, and that it is incapable of individual reasoning. While these deductions are indeed interesting to the speculator and perhaps satisfying to the scientist, the present intellectual status of woman and her capácity for thought and action discredit allusions to her mental deficiency. Basing his conclusions upon animal experimentation, Thury, of Geneva, ventures the assertion that should fertilization occur four days before the appearance of menstruation, the child will be female, while impregnation five or six days after termination of the menses will result in male offspring. In twenty-nine experiments made upon cattle by a Swiss farmer, control of sex seemed possible without a single failure, and Guiard is quoted as observing thirty-five cases in the human which apparently substantiated the theory of Thury.

THE BACILLUS PARALYTICUS IN THE DOMAIN OF PSYCHIATRY.

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describes the surgical procedures and instruments that facilitate the application of these principles. The arrangement is especially fine, and while it does not contain much new material, it affords a record wherein that which is reliable can be found.

The last section—"Surgical Prognosis"—is a difficult subject for clear presentation. Doctor Leonard Woolsey Bacon, Jr., of New Haven, has done the work well under the headings, of Age, Sex, Constitution, Integrity and Functions of Organs, and Environment.

The writers have evidently been selected with care, and as a record of the science and art of surgery the work is a great success. Much pleasure is anticipated in reading the succeeding volumes.

C. G. D.

*A complete system by representative surgeons of the United States and Canada. Eight royal octavo volumes, illustrated by chromolithographic and other plates and by line and half-tone engravings. Edited by Joseph Decatur Bryant, M. D. and Albert Henry Buck, M. D. William Wood & Company, New York.

A TEXT-BOOK OF HUMAN PHYSIOLOGY.*

THE translation of "Tigerstedt's Physiology" is a great advantage to those who cannot read the original. This has long been a favorite book for those who wish to get the most recent exposition of modern physiology, and especially in the important domains of nutrition, metabolism and the circulation. The part on the circulation in the present edition is still very valuable, although not so full in the light of recent investigations into the cardiac function as the text-book of Professor Howell. Every practicing physician should review his physiology diligently and frequently, and for this purpose the book under review can be confidently recommended, the translation being well done and the mechanical execution excellent.

*By Doctor Robert Tigerstedt, Professor of Physiology in the University of Helsingfors, Finland. Translated from the third German edition and edited by John R. Murlin, A. M., Ph. D., Assistant Professor of Physiology in the University and Bellevue Hospital Medical College, New York City. Price, cloth, $4.00. New York and London: D. Appleton & Company, 1906.

INTERNATIONAL CLINICS.*

THIS volume, which is really Doctor Kelly's valedictory, contains the usual variety of valuable practical articles. The number is too great to permit of detailed review; but attention should be called to an article on the "Prevention and Treatment of Chronic Nephritis," by James M. French; one on "The Etiology and Treatment of Chronic Constipation," by J. Dutton Steele; "The Nonoperative Treatment of

Renal or Ureteral Calculi Causing Colic," by Howard Lilienthal; "Clinical Observations on the Care of Tuberculous Subjects," by Wm. Porter; "Pulmonary Tuberculosis in the Middle-Aged and the Aged," by J. Edward Squire; "Recent Additions to Our Knowledge of the Physiologic Influence of Lowered Barometric Pressure," by Henry Sewall; "Obscure Renal Hematuria," by Arthur R. Elliott; "Myxedematous Infantilism and Incomplete Myxedema," by Roger S. Morris; "Syphilitic Aortitis," by C. Dieulafoy; "Recent Progress in Disorders of the Adrenals," by Leon Bernard; "The Principles of Treatment of Fractures of the Lower Extremity," by George G. Ross; "Suggestions in the Treatment of Hip-Joint Disease," by Russell A. Hibbs; "Vesical Tumors," by David Wallace; "The Treatment of Hemorrhoids," by George P. Mueller; "Placenta Previa and Its Treatment," by Joseph B. DeLee; "Lacerations of the Cervix of the Uterus and Their Repair," by W. A. Newman Dorland; "The Management of Chronic Cystitis in the Female," by Daniel H. Craig; "The Laryngological Complications of Pulmonary Tuberculosis," by E. F. Trevelyan; and "The Mastoid Operation," by Charles W. Richardson.

Doctor Kelly has set a very high standard in the "International Clinics" and one that will be difficult to keep up; but the plan and execution of the books, even on a lower scale of excellence, would cause them to rank among the most valuable books accessible to the general practitioner. G. D.

*A Quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles. Edited by A. O. J. Kelly, M. D.

THE BASEL ANATOMICAL NOMENCLATURE.*

One of the essentials for the progress of any science is an exactness in its terminology, and this is especially the case in the descriptive sciences. In anatomy the need for a nomenclature which should be precise has long been felt, and as far back as 1880 attempts were made by Professor B. G. Wilder to secure some uniformity in the use of anatomical terms in this country, endeavors being made to enlist the influence of both the American Association for the Advancement of Science and the Association of American Anatomists in the matter. For one reason or another but little progress was made towards the desired end until 1887, when the matter was brought to the attention of the newly established German Anatomical Society. In 1889 this organization created a commission to deal with the question and appointed upon the commission a number of the foremost German anatomists, later adding representatives of other countries.

As a result of the labors of the commission a list of terms was submitted to and adopted by the society in 1895, and its meeting being held in that year in Basel the list has received the appellation of the Basel Anatomical Nomenclature or, more briefly, the B. N. A. In this list some 4,500 terms were recommended for use, having been selected from the 30,000 or more which may be collected from the various standard text-books, the enormous reduction being possible from the fact that the great majority of anatomical terms are synonyms. For obvious reasons Latin was selected as the language of the nomenclature, it being left to the various nationalities to express in their own language the Latin terms.

There can be no question as to the advisability of the adoption of the B. N. A. It may be slightly irksome at first for English-speaking anatomists to recall some of the terms employed, to speak, for instance, of the os magnum as the os capitatum or of the lateral sinus as the transverse sinus, but such decided differences are few and the trouble of becoming familiar with them will be largely compensated by the greater simplicity, accuracy and convenience that will result from a uniform nomenclature.

To place in the hands of American anatomists the Basel list in a convenient form has been the task assumed by Professor Barker in the book which forms the basis of this notice. The nomenclature, with an English translation of each term and an indication of the more familiar English term when the difference is at all extensive, is now accessible to every anatomist, and it is to be hoped that its publication in this country will lead to the adoption of the B. N. A. in all our medical schools.

J. P. M'M.

*Anatomical Terminology, with special reference to the Basel Anatomical Nomenclature. By Llewellys F. Barker, M. D., Professor of Medicine, Johns Hopkins University; formerly Professor of Anatomy in Rush Medical College, Chicago. With vocabularies in Latin and English. P. Blakiston's Son & Company, Publishers, Philadelphia, 1907.

ATLAS AND TEXT-BOOK OF HUMAN ANATOMY.*

THE value of such an atlas is next to that of the actual dissection. The excellent color plates of this volume will give to the student accurate pictures of what he has seen in the laboratory and serve to impress these firmly upon his mind. To the practitioner they will be of equal value in recalling anatomical relationship. The text and atlas have been combined in one volume and this is an advantage over the German edition. The Basel anatomical nomenclature in an anglicized form is used. The work may be recommended to students and practitioners, as a valuable aid in fixing and recalling anatomical facts.

*By Professor J. Sobotta, of Wurzburg. Edited, with additions, by J. Playfair McMurrich, A. M., Ph. D., Professor of Anatomy at the University of Michigan, Ann Arbor. Volume I. Quarto volume of 258 pages, containing 420 illustrations, mostly all in colors. Cloth, $6.50 net; half morocco, $7.00 net. Philadelphia and London: W. B. Saunders Company, 1906.

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ORIGINAL ARTICLES.

MEMOIRS.

A FATAL CASE OF TYPHOID.*

GEORGE DOCK, Sc. D., M. D.

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FATAL cases of typhoid fever are always interesting because we can draw some lessons from them. The present case I am prompted to report because about a year ago we had in this society a discussion on a fatal case of typhoid fever operated for perforation. The present case was not operated but illustrates some points brought out. The patient was a student, twenty-five years of age, who felt perfectly well to the 9th of October. Then he was taken with headache and fever and a feeling of weakness and went to bed. In a couple of days he had more fever, and the 13th of October was admitted into the hospital with many symptoms indicating typhoid fever; so a diagnosis was made at once by Doctor Kane and confirmed by the others who saw him and shortly ratified by the Widal test.

It is not necessary to rehearse the details of the symptoms. On admission on the fourth day of the disease he presented the appearance of a rather sick patient, and had three important symptoms to indicate that:—first, more delirium; more tremor than we usually see in typhoid fever before the second week, in fact we do not often see it nowadays in typhoid fever—it was more than we have seen in several years; and also a good deal of meteorism. Although he had taken cathartics and no food for three or four days before, still he was distinctly tympanitic. He also had a weak heart beat, and even on admission a soft systolic apex murmur; his pulse was a little higher on admission—a little over 100—with a temperature of 104°, than is usually found in patients of his age and physique.

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*Report, with presentation of specimens, to the ANN ARBOR MEDICAL CLUB, November 19, 1906.

On account of his severe symptoms and heart weakness he was an eminently proper case for the cold bath, and so we began giving him tubs at 90°, reducing them to 70°. He took the tubs very well. The temperature was influenced very little by the baths, although not getting any higher after he entered than it was on admission. In other respects he did not improve so much. His delirium was not greatly improved, and that is a prognostic sign, because usually the bath removes delirium if the patient comes under treatment early enough. His heart was slightly improved for a while by the baths. The patient had another calomel cathartic after admission, and then cold enemas, a quart of cold water every morning, thus trying to bring about regular movements of the bowels. He was given a low diet, and there is an interesting thing in connection with the case in this respect.

For many years typhoid patients were not allowed full diet; now we give them soft boiled eggs or custard as soon as the patient can digest them. But this patient never had anything but liquid diet, and very small quantities of that, only a few ounces of milk a day. He lived mostly on albumen water, and for a few days small quantities of broth and grape juice and orange juice and things of that kind. But the tympanites became worse, so that the week before he died it was necessary to do something more. We then resorted to various things, such as calomel, which was useless; then for a couple of days he had large doses of salol, but they had no effect at all; then we used a high rectal tube; and then, not so much for the tympanites, but because it was a proper case for turpentine internally, according to the Woods, we gave that, but the patient became no better. The tympanites became worse; ice-bags and turpentine stupes did no good; a soft catheter kept high up in the colon for ten minutes every two hours did very little good. So the temperature continued to the 27th.

The patient had been taking the tubs to this time, but had none on the 27th. He had an appearance at this time that was highly suggestive of impending hemorrhage, or perforation. He was becoming worse and the tympanites especially was increasing in degree; and at that stage, the third week, there was very serious danger of hemorrhage or perforation; but there was no occult blood and no visible blood. In the evening of that day he complained of pain in the abdomen, a sort of vague pain, difficult to distinguish from the pain of the tympanites, but looking back on it, I have no doubt it was the pain of the preperforative stage. But he went through the night fairly easily. The next morning at 8:30 the pain was sharp, near McBurney's point, as he localized it, and that was followed by a rise of temperature following the early morning fall. The temperature rose a little higher in the night and then fell in the morning, but rose again just perhaps about the time of the pain, and at the next time it was taken it was a degree and a half higher than before. The pulse also went up from 116 to 124 and in the next two hours to 132; also at the same time peristaltic noises disappeared from the abdomen. The liver dulness was not immediately affected; the dulness had always been high up. The leukocytes also increased. They had been running in the neighborhood of six and seven thousand before, but they ran up to fourteen thousand nine hundred and dropped again to nine thousand. Making allowance for the difference in the counting, because it happened that this occurred on a Sunday and owing to various duties on those days two different men made the counts—although the original counter made the second count—it showed, at any rate, a leukocytosis.

In the meantime Doctor de Nancrede had seen the patient and the question of operation was immediately considered; but owing to the condition of the patient—especially his great distention—the abdomen was then a couple of fingers above the level of the ribs, and owing to the whole history of the case, an operation was not urged on the patient or the brother. The patient, of course, was in no condition to make any statement about his wishes; and the brother, although he was willing to have anything done, was informed that the case was not one in which operation should be urged. It was an unfavorable case from the very beginning, but if everything had been favorable, one might have operated, although even then it was not the sort of case one would pick. So we continued treatment, and, in addition, washed out the patient's stomach, and that was very timely, because soon after that hiccup and vomiting began. Eserin had been given, according to the suggestion of Doctor Edmunds; but, owing to some misunderstanding, was not continued long enough to enable us to tell whether it was doing good or not. The temperature fell after a slight rise and then rose again, and the next evening at 8 o'clock the patient died, without having any material change. The patient's blood pressure had been low all the time, 80 to 90 millimeters, but at the time of the pain it ran up above 100, once to 114.

We were allowed an autopsy, but owing to another accident, a change in the undertaking assistant, the patient was injected with embalming fluid. That blunder was responsible for two unfortunate results: The tympanites was removed so that we could not tell the exact degree of this condition, and the abdomen became very much contaminated, so that although Mr. Burnett ran a series of cultures it was difficult to say where the germs came from. The typhoid and the colon bacilli were found in the liver. The notes I will not read in full, but the intestines showed comparatively few lesions in the ilium, in the lower Peyer's patches, with a good many in the colon, not very severe except in the cecum, and those in a comparatively late stage. What sloughing had been present had completely cleared away, and in some of the lesions there was microscopic evidence of beginning healing.

If the patient was sick only twenty days, as the symptoms indicated, he must have had a rather rapidly progressing course. Probably he was sick a few days longer, say along in the middle or toward the end of the fourth week. An interesting fact in this connection is not taken into account enough, and that is that resolution occurs in a great many typhoid lesions without sloughing. The lesions in the intestine were not very severe, but they were sufficient to have killed the patient provided the intoxication was in proportion. There was also a diphtheritic chlolecystitis, which shows fairly well in the specimen. There was slight beginning endocartitis of the mitral valve. He had, then, conditions that would have made it impossible to recover entirely and it is doubtful whether he would have recovered at all. He represented a very severe case, and from the extent of the lesions in the cecum and colon we can understand better the reasons for the early and persistent tympanites, for tympanites is likely to occur in patients that have severe lesions in the large intestine.

The specimens prove that it was just as well not to urge an operation; but there are lessons to consider. Operations for perforation in typhoid fever are still not done as much as they ought to be, and for the simple reason that we are entirely too exacting in our requirements for diagnosis; we wait not merely for perforation symptoms, but for peritonitis symptoms. For up to 1902 the diagnosis applied only to complete perforation, with fairly widespread infection of the peritoneum. We were in the condition then that we were with appendicitis before 1886. Before those days appendicitis meant peritonitis; but after we discovered the symptoms of the disease in the appendix before the patient got a severe peritoneal infection, it was comparatively easy to make a diagnosis of appendicitis and to operate very far beyond the appendix. In typhoid we expect too much from signs. I am not speaking of this case because we recognized the condition early enough provided the patient had been in a condition for operation. But if, for example, the patient had been in better condition nothing is more likely than if he had been operated when the pain was discovered—say within a couple of hours—and had not had the gallbladder and endocardial infections, nothing is more likely than that there would have been a favorable result. Patients with more severe lesions have recovered. The point is not to wait until the patient has peritonitis but the minute it is suspected he has perforation—that the infection is going through the serosa, as shown by pain or change of temperature or leukocytosis or rise of blood pressure, or abdominal signs,—then the thing to do is to do what we do with appendicitis when we meet it early enough—operate at once and do what we can. But, as I pointed out last year, we must not give people the idea—as unfortunately too many reports have—that every case that is operated for perforation will recover, because from the very nature of the disease some are bound to die. There may be too much infection; complications aside from abdominal lesions may occur; a great deal rests in the selection of the case, and the main thing is in taking it in the earliest possible stage and deciding at once if there is any chance, and if there is not then the thing to do is not to spoil statistics too much by operating.

Just a word on the matter of feeding. The trend of opinion is coming around to belief in the safety of fuller feeding. That is the method that we follow here. This case illustrates that light feeding alone will not save all cases or put them in a condition for operation. A prominent surgeon complains that teachers of medicine spend too much time showing how much food a typhoid patient can take. He thinks it better to show how little they can live on. We have seen how little some can live on and also starve on; and this case on the one side and cases that have been fed more freely on the other side convince me that if a patient can digest the food and has no bad symptoms, no pain, no tympanites, no undue rise of temperature or pulse, then they get along faster and have less likelihood of having thrombosis and many other complications.

Ann Arbor, 602 Huron Street, East.

THE DIETETIC TREATMENT OF BRIGHT'S DISEASE.*

GEORGE W. McCASKEY, A. M., M. D.
PROFESSOR OF MEDICINE IN THE INDIANA MEDICAL COLLEGE, DEPARTMENT OF PURDUE UNIVERSITY.

THE dietetic treatment of disease has at last assumed its proper place in the first rank of remedial measures. The greatest problems of internal medicine are those having to do with the chemical processes of the body, included in the blanket term metabolism, which in its broadest sense includes everything from salivary digestion to the pulmonary-exhalations of carbonic acid on the one hand, to urea and its coadjutors on the other; and the intimate relationship which these problems bear to the kind and quality of food ingested must be obvious to every one upon the slightest reflection. The dynamics and tissue reconstruction of the body are the great factors to be considered, and much light has been thrown upon them by discoveries along the line of chemicophysical research during the last few years. To a certain extent diet quantitatively and qualitatively considered is susceptible of mathematical calculation, and in certain morbid conditions, such as those which form the subject of this paper, these calculations are of the highest value.

In both acute and chronic Bright's disease the proper regulation of diet is clearly the most important requisite of rational treatment. In the acute form we are dealing with a toxic process with a tendency to self-limitation and the kidneys are the organs principally involved. The most complete and perfect rest of these organs, the principal function of which is the elimination of proteid and saline waste and fluid, is the first indication. In well nourished patients absolute starvation for the first two or three days, with the possible exception of a small amount of carbohydrates will best accomplish the object. There will of course be a small amount of tissue waste during these few days but this is relatively unimportant and insures the minimum amount of work on the part of the kidney in the elimination of proteid waste.

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*Read before the TWELFTH COUNCILOR DISTRICT MEDICAL SOCIETY, at Fort Wayne, Indiana.

After the first few days small amounts of proteids should be given and the carbohydrates increased, egg albumen, small quantity of milk when well borne, and scraped meat, from which the extracts may be removed by prolonged boiling are ideal foods. Thoroughly well cooked cereals with a little cream or milk are also staples. The cereals, unless some of the superheated varieties are used, should be subjected to prolonged boiling or steaming—at least three hours, in order to secure thorough disintegration by heat. This lightens the work of the digestive organs, hastening both proteolysis, and starch digestion, and favors rapid absorption from the upper segments of the alimentary canal, and thus limits bacterial processes with their resulting toxins which rapidly increase as the food debris descends the intestinal tract, The limitation of these toxins to the greatest possible extent is vitally important as their elimination from the blood devolves upon the kidneys, which in the large majority of all cases of acute nephritis, are suffering from a lesion produced by the excretion of toxins of some sort—diphtheric, scarlatinal, et cetera. It is taken for granted, as a matter of course, that the *primæ viæ* have been unloaded as a preliminary measure of treatment, in order to do as little additional damage to the kidneys as possible by the absorption of intestinal toxins.

If something is required for the cereal it should not be the cane sugar of commerce which requires inversion into glucose before it is either absorbable or assimilable. The digestive organs should be given glucose at once and saved the labor of forming it from cane sugar. Honey is an available form of glucose, a form which the observation of some one discussing diabetes, I think Von Noorden, appears to show is more readily assimilable than the dextrorotary types.

The precise amount of both carbohydrates and proteids to be allowed must be a matter of judgment in the individual case. The initial period of starvation is not advisable or at most for a very brief period in cases in which the state of general nutrition does not warrant the assumption of a reserve supply of glycogen in the liver and muscles; the organic functions cannot go on without oxidizable pabulum, and if carbohydrates are not assimilable the proteids will be utilized and they are both physiologically expensive and probably less readily utilized. But even here no hard and fast rule can be made, for often the digestive and assimilative functions are so seriously impaired that it would be obviously unwise to hazard the introduction of very much food into the stomach. In such cases rectal alimentation may be resorted to, if the nutritional demand appears urgent, because if the lower bowel be first flushed out considerable absorption can take place before bacterial processes have time to gain much headway.

If the case pursues a favorable course, the quantity of food without substantial change in type should be cautiously increased, checked, and controlled by accurate scientific calculation of the actual amounts of the various classes of food, taking care that they never exceed the physiological demands of the organism under the altered dynamic and metabolic conditions. Data relative to the percentage composition of the various food staples are readily available, and should form a part of the armamentarium of every well qualified physician, not only in the management of Bright's disease but in a large number of other diseases as well. Hydrocarbons should be used only to a limited extent, cream and butter being perhaps the most available form.

The quantity of fluids to be given in a case of acute nephritis depends upon a variety of circumstances. During the stage of acute engorgement when there is a very limited or even suppressed secretion the ingestion of any considerable quantity of fluid is irrational in the highest degree and may be fraught with the gravest danger. Arterial tension is already usually high, and depletion rather than engorgement is what the volume of the circulating fluid demands. To still further augment its volume, and thereby heighten the renal pressure, is to invite further damage to the renal secreting structure. The quantity should therefore be as small at first as is compatible with the reasonable relief of thirst. As renal function improves the quantity is gradually increased, but caution should be exercised, as rest and not work is the prime indication.

Entirely different consideration must enter into the dietetic management of chronic Bright's disease. We are no longer dealing with the conditions of an acute intoxication with a tendency to self-limitation, and in nonfatal cases, to recovery more or less complete, but with possibly sufficient damage to the secreting parenchyma to at once transform the case to one of the chronic type, a result which will hinge very largely upon the management of the acute case, and the care and surveillance exercised in the subsequent control of the patient. We have here to deal with morbid conditions for the most part permanent in character, and with a more or less pronounced tendency to progression, and which is rarely if ever limited to the kidneys. The entire circulatory apparatus is implicated in varying degrees, and along with these conditions of perverted circulation and impaired kidney function there is necessarily widespread disturbance, at first the result of functional but later of organic changes. Varying grades and types of toxemias, of both intestinal and metabolic origin result, and the clinical picture becomes exceedingly complex, while the problems confronting the clinician are equally so. Indeed there is probably no other class of cases, the highest interests of which rightfully demand a more thorough all-around study in the light of modern scientific methods than the one now under consideration. The dietetic treatment can only be rationally based upon information thus obtained. We are dealing with patients who are seriously ill, whose illness has probably extended over a series of years, and is likely to continue through another series of years to come, the precise length of which may easily depend upon the tactfulness and scientific accuracy of our advice. Under such conditions it is perfectly obvious that the ideal diet, difficult of practical attainment, is one that includes in easily digestible form the minimum amount of proteid food required for the repair of tissue waste, and the minimum amount of carbohydrates and hydrocarbons needed for the dynamics of the organism. The latter, for the most part in the form of starch, supplemented by the more assimilable forms of sugar, and a little fat should be ample for the force-producing purposes of the body, because the slightest deficiency in this particular class of foods compels the organism to exercise its reserve function of oxidizing the proteids for purposes which do not require the nitrogenous molecule.

Physiologically speaking this is extravagant and wasteful, and what is even more important from the present point of view, throws an unnecessary burden upon the kidneys inasmuch as the nitrogenous waste must be removed by those organs. The amount of starch and allied foods required is difficult of exact determination. It varies within wide limits, according to the amount of work that the organism has to do. A large portion of it is consumed in maintaining the body temperature although this also varies with the amount of muscular work done as there is with increasing work a largely increased heat loss owing to the greater conduction of the skin, the evaporation of the augmented perspiration, and the rapid interchange of pulmonary gases incidental to accelerated breathing. The quickening of the respiratory and circulatory functions also requires greatly increased muscular work for their maintenance, and this, of course, can only be evolved by the oxidation of food products. In addition to all this, and really producing it, is the general muscular work, which consumes force-producing foods (that is, carbohydrates and fats if available, and proteids, taken even from the tissue, if they are not) precisely proportioned to the amount of work done. It is perfectly obvious therefore, that there can be no uniform standard for the minimum requirements of force-producing food. It will vary, first with the weight of the individual, and second with the unstable factor of muscular work. While it is difficult to give any very definite figures, I believe that the carbohydrate intake in chronic Bright's disease should vary from about two hundred to two hundred fifty up to three hundred fifty or four hundred grammes. In the absence of gastrointestinal disease a slight excess is unimportant; while it is more important that it should be ample than that it should be precisely limited to the actual demands. If the transportation facilities of the red blood cells are good and the glycogen storing capacity of the liver and muscular apparatus is normal, no harm can come of a moderate excess of the products of carbohydrate digestion in the blood, in the cases under consideration. As already pointed out, however, any deficiency compels the organism to oxidize the proteid material for dynamic purposes, and among other objections, the waste products of such food pabulum increase the work of the kidneys.

In regard to the most desirable forms of carbohydrates the principles enumerated in the discussion of the acute type should govern us here, although wider latitude and larger quantities are of course desirable. The lessons learned in diabetes should be utilized here and the digestion and assimilation of carbohydrates made as rapid and easy as possible.

Fats are to be used with discrimination, their quantity depending upon the digestive capacity. From twenty to fifty or more grammes may be allowed, and if either starch or fat digestion should be the better then the one may be increased at the expense of the other to furnish the requisite number of calories, fat having almost exactly double the caloric value of carbohydrates.

When it comes to the nitrogenous elements of food, more accurate data are available, and it is of the highest importance that these data should be fully understood and scientifically applied in the management of chronic Bright's disease. The quantity of proteids required to maintain the body in a state of nitrogenous equilibrium is not yet fully determined. Recent investigations of Chittenden and others seem to show conclusively, however, that the minimum standards which have been current for some time have been altogether too high. These experiments show that it is possible for an individual of average weight to maintain an equilibrium of proteid metabolism on one-half or even one-third of the quantity heretofore considered necessary. Whether such reduced standards of proteid intake are to be considered as safe or desirable in ordinary conditions of health is a problem which I do not believe has been solved. But in such a condition as chronic Bright's disease the applicability of the facts which these investigations have demonstrated is perfectly clear and extremely important. The quantity of nitrogenous food recommended in accordance with the Voit standard should be reduced to one-half or one-third of those amounts regardless of the possible consequences which might ensue upon their rigid application to individuals in ordinary health. The renal lesion is one of the most important factors of the disease and the highest degree of rest of these organs which is compatible with a reasonable standard of nutrition should be enforced. Assuming, say one hundred twenty grammes of proteid as the current standard, my practice is to attempt to establish an equilibrium on from sixty to eighty grammes for a patient of about one hundred fifty pounds weight. There are, of course, some patients with badly damaged kidneys who cannot excrete the nitrogen absorbed from even this amount of proteid. This, however, is a matter which can very readily be determined by a very simple test. Give the patient an amount of proteid food considerably in excess of that indicated in an easily digestible and absorbable form and note the resulting amounts of urea excreted per twenty-four hours. If they are capable under such a test of excreting say fifteen to twenty grammes of urea for each twenty-four hours, their capacity to deal with the standard of proteid diet above indicated has been demonstrated. Nevertheless, although the kidneys are able for a short time to do a very much larger amount of work than this standard of diet would require, they should not habitually be subjected to such a strain but the patient should be rigidly restricted to the quantities above indicated. If it is found that the kidneys are unable to deal with the amount of nitrogen indicated the diet should be absolutely restricted within the limits of renal capacity shown by properly conducted test, even though it does mean too low a standard for the nitrogen balance; for the patient will live longer and live better if the blood is not surcharged with the retrograde products of proteid metabolism beyond the capacity of the kidneys to eliminate.

The amount of fluid to be permitted in chronic Bright's disease is a matter of the utmost importance. In the palmy days of the exclusive milk diet treatment of these cases patients suffered in two directions. They, on the one hand were underfed because of the difficulty of getting sufficient nutriment in this form in which besides there was a disproportionate amount of nitrogenous food in comparison to the carbohydrates and hydrocarbons particularly when the milk was skimmed, and on the other both the stomach and vascular apparatus was disastrously overdistended by the inordinate amount of fluid. The already disabled stomach was still further weakened by the load which it had to carry, digestion being still further impaired while the cardiovascular apparatus which bears the brunt of the disease and is perhaps the primary seat of organic change was overtaxed to a serious degree. While it is essential that patients should have sufficient fluid to permit the osmotic processes of the body to proceed satisfactorily it is obviously important that the total volume of fluid which the heart has to force through the narrowed inelastic arterial tree should not be greater than is necessary. While it is impossible to formulate anything like an inflexible rule it may be said that where the cardiovascular lesions are pronounced that the intake of fluid should not exceed one and one-half to two pints in the twenty-four hours. The volume should be smallest during the waking hours when there is more activity and a greater demand on the heart's energy, but can be increased during the night while the patient is in the recumbent position as the blood then flows along horizontal lines and the required work is much less.

Without entering too much into detail such appear to me to be the principal points to be kept in view in outlining the diet in cases of chronic Bright's disease. These patients will fare much better in the future than they have in the past if these principles are intelligently applied to the individual case after a proper study has been made. They are clearly entitled to the great benefits which they can receive in consequence of the recent advances in our knowledge of the physiology of nutrition.

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THE GREEN STOOL.

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Probably there is no one, no, not one, who may see this paper, and perhaps read it, who has not seen, noted, and it may be wondered at, probably asked about, and may be more or less carefully investigated the subject of this paper, and yet I am quite certain that I shall not greatly err if I say that there are few subjects of equally obvious importance into which so little investigation has been made, about which the universal fund of information is so small, and full and perfect knowledge, if so be that any have it, which may be doubted, is the possession of so few.

In student days it chanced that the writer asked of one of the professors in the medical school which gave him his degree in medicine, "Doctor, what do you suppose is the real cause of the green stool?" The professor answered, "I am not at all sure of the cause, but I am very sure of the consequence." The writer eagerly, perhaps too eagerly, asked, "What is it, doctor?" The professor replied, "The exhibition of calomel." The bystanding students, for this professor, like Trousseau and other famous clinicians, was always attended by a long "queue," laughed loudly, if not long, and we do not pretend to say if their mirth was real, or if they laughed with "counterfeited glee" as did the pupils of the master in Goldsmith's poem. It may have been a wise reply, it certainly impressed upon some of his students the importance of giving "calomel" in all such cases, but in the minds of some it caused a feeling which, so far as those men were concerned, did not at all increase his usefulness, indeed it may have diminished it. Certainly the reply was no evidence of exhaustive investigation, and some of that group of students sought other guides forthwith, and it may be not unwisely.

It is a fact most unfortunate that many who should perhaps be of another view appear to hold their duty done when they have made the "exhibition of calomel" which they consider to have been indicated by the said green stool and go no further in the pursuit of information. The result appears very unsatisfactory, for not one of the many very skilled men who utilize this symptom in the way the professor suggested appears to see the necessity of much more information than we have yet in hand as well as exhaustive study of that information.

Thus in Boston's "Clinical Diagnosis," a splendid compend of diagnostic information, the question is dismissed with a *dictum* and without discussion. He, the author just referred to, on page 361, says, "BILIOUS STOOLS.—The so-called 'bilious stools' vary in color from bright yellow to dark green. This color is due to the escape of unchanged or but slightly altered bile which has passed hurriedly through the bowel." On page 239 of the same book appears another no less distinct statement: "Biliary urine when fresh contains bilirubin, but after it has stood for a time biliverdin is formed as a result of oxidation." These statements are sufficiently explicit, and in them is implicitly the statement that bile-green, "biliverdin," is an oxygenation produced no matter what its original source may be, but this source is implicitly at least the oxygenation of the bile pigment of brown, brown-red or ruddy hue, which we know as bile-red, or "bilirubin."

The "Medical Dictionary," so-called, tells him of sundry pigments derived from or present in the bile of which two are green, and both are stated to be derived by oxydization from bile-red, that is, from "bilirubin." These two pigments are "biliverdin" and "biliprasin," and the composition (not the formulæ, for the formation of the molecule is questionable if the opinion of certain expert chemists is accepted as trustworthy) of the three pigmentary substances is said to be, "bilirubin ($C_{16}H_{18}N_2O_3$), "biliverdin" and "biliprasin," both green pigments ($C_{12}H_{20}N_2O_5$) and ($C_{16}H_{22}N_2O_6$). It is not to be seen when the composition is thus recorded how the molecule is formed, nor can anyone say, if words be strictly used, that the molecules as given can be formed one from another by simple oxygenation for other atoms also are added.

Although the search has extended in many directions and has extended over books not a few, no method has yet been found for telling how to identify the green molecules except by a full analysis, nor has any record, taking cognizance of the possible difficulty, informed us which of these greens is the one which colors the green stool. This should be made possible by some process easily to be worked at the bedside, some process as simple and as easy as those processes by which we can if we wish to make rapid urinary determinations. It is important that this should be understood. The question is not concerned with the possible proceedings of the expert chemist engaged in the practice of medicine, but with the methods of the average practicing physician, who requires his chemical examinations formulated and reduced to some single, simple and effectual act, of which the ideal is found in the vest-pocket laboratories of a few manufactures in handling which the directions have been simplified to the last degree, even for rapid but effectual quantitative determinations. Equally important in many instances, for example, is the present one is the simple determination between two substances.

At present we do not know, and have no means of determining, which of the two green pigments is before us in any given case, and yet it must be of the greatest importance in very many instances. Certainly the symptoms which are grouped about this central phenomenon differ much and in a rough way they may be said to force the cases, in which the green stool appears, into two categories or classes:—is this distinction due to a difference in the pigment, or rather to the cause which forms one pigment rather than the other? If it be so, is it not of the utmost importance that we distinguish between them, distinguish easily and very rapidly? Again it is important to know which of these pigments stains the "nasty mouthful" which belongs to certain cases of indigestion. At postmortem examinations also it is important to know which is present because only thus can many other important questions be answered.

Beside these still stands a group we have not mentioned, questions far too little considered. (1) If the "green pigment" be caused by the oxidization of the yellow bile, which yellow is usually considered to be the natural color, whence the process? What is the cause? Why does it take place in some instances and not in all? If it be a fact that the bile is so rapidly evacuated from the intestine, why does giving a cathartic, such as some mercurial salt or even the metallic base, in some instances so rapidly give relief? If the excited intestinal muscles are causing a too rapid evacuation of the contents, why does the cathartic give relief while seemingly at least it gives a further increase to the motion? Or does the oxidized bile act as an irritant and does the relief come from the complete emptying of the oxidized (green) bile from the intestine? We all have noted that emotion sufficiently prolonged may cause the absorption of bile into the tissues, from the blood vascular system, and we generally assume that in course of time this pigment will appear in the urine, which will have a distinct "greenery-yallery" hue; why then do we sometimes see the pigment change green before it comes to excretion, and *which* green pigment has been found in this case?

Finally, this question will demand an answer, when all the others have met their due reply, and will demand it earnestly, "Why do we meet the "green vomit" more frequently among adults and the green stool in children's illnesses, assuming of course that we do so meet them, which has not yet been proven true?

TREATMENT.

But while such a shade of doubt and ignorance hangs over the pathology and pathogeny of this condition the treatment to the minds of many appears reduced to the simplest routine. Given a case in which the green stool appears the physician sees in the emptying of his patient's bowel his whole duty and he gives a mercurial of some sort. The limit of choice is very narrow—calomel is easily first, and chalk with mercury comes second. Sometimes the calomel is given alone, but in most cases it is mixed with sugar of milk and some alkaline substance, as for example, chalk or soda bicarbonate. When the metalloid or metal is given it is usually rubbed up with chalk into the usually acceptable grey powder. Many physicians do certainly give a reason for their choice in using mercury instead of its chlorid, contending that if any chemical change is needed to secure the preparation's usefulness this change is to be obtained more easily from the metal than from any salt, but if a change takes place, what form does the useful portion of the metal take? Is it an albuminoid? Is the mercury taken into a molecule perhaps already complicated beyond our imagination to form a substitution product? Simply, we do not know, is all the answer possible today.

Still less do we know of the reason why of the results we see. The opinion of the practitioner amounts to less than nothing, for he also needs the knowledge which has been indicated. We see the sequence in time; we infer the consequence of effect upon the cause.

In some cases physicians have given, 'tis said with the very best results, combinations of "ipecac root" with the "grey powder" and a small quantity of opium in powder. This mixture is said to have proved useful in cases where calomel, or calomel with opium and soda, had been given practically without results. It is also well worthy to be noted that in some instances the discharge from the bowels is most intensely acid, the result being to excoriate the skin and produce serious mischief.

The picture changes instantly when the green color disappears and gives place to a bright yellow or yellowish brown, but the same is just as true in those few cases of this type.

But mercurials are not the only treatment which has been found useful, in fact in nearly quite one-half and in some seasons in more than one-half the cases the results are best when the entire treatment scheme is raised from another foundation. But it is equally true, if certain writers may be trusted, that the areas of usefulness meet but do not superpose. This fact alone would seem to us to justify much further study.

In this group of cases, which some have said to include all the children brought up by hand or fed by artificial means, quite another group of tools has proved of use, and the vast difference in the results from cultures may be in some degree indicates a reason why. In the cases of the first type at least two students have declared that the figured elements are relatively few and that two types are certainly wanting. One series of studies published about three years ago maintained that "in those infants who were mother-fed these figured elements have been found only once in forty cases, and in this case the bottle was used because the child demanded food beyond the mother's strength. But in bottle-fed children's cases this element could be predicated as always found," but of this we now say nothing. Yet it is certain that in these cases an immediate use of the sulphocarbolate of soda, sometimes followed by the same salt mixed with zinc, or the double sulphocarbolate of zinc and soda acts as by magic. The intestine disinfected the plague is stayed. There is some doubt in the minds of men competent to judge, how soon after the giving of the sulphocarbonate the intestine should be emptied, but judging by the writer's experience, and by this only, it may be just as well to take the matter slowly into hand. If after the action of the disinfecting drug the irritation of the bowel appears to subside at once, well and good; but if not, then give of calomel "dose enough" to empty all the bowel may contain, then give very small doses of podophyllin, and it may be boldine also will be found useful, with a small dose of olive or other bland oil, but not of castor oil, not even in emulsion. Thus treated we may succeed in preventing an illness which might be serious, this the more probably the sooner we act after the first green stool.

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ORIGINAL ABSTRACTS.

SURGERY.

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A PROPER SHOE AS AN AID TO TREATMENT IN FLAT (OR WEAKENED) FEET.

ALTHOUGH it does not follow as a matter of course that people should use ready-made teeth as naturally as ready-made shoes, yet the comparison is very suggestive. How often the expression of "breaking in the shoe" is used when in reality the wearer is also breaking in the foot! In these days of ready-made and ready-to-wear articles of all sorts we have easily fallen into the habit of subjecting our feet and feelings to the fashion of the times irrespective of the important mechanical functions of the foot. We seem to ignore the fact that the foot is a machine to do work and to regard it as a model for display. Berry (*American Journal of the Medical Sciences,* Volume CXXXIII, Number V) defines a proper shoe as one that supports the foot in its normal position when at rest and allows the normal motions to take place during activity. It is not an attempt to improve on nature, but when nature has been violated an attempt may be made at correction. In order to properly shoe a foot its individual peculiarities must be observed. Not only are its size in general and the instep to be noted, but the weight bearing surface and the outline of the foot must be considered and the last so constructed as to cause the body weight to fall over its center. What an excellent plan it would be if every one had his own individual lasts made and individual measurements taken of his feet and ankles, according to which intelligent shoemakers might fashion correctly-fitting shoes.

In the article referred to the author illustrates the lines of body weight in the ordinary fashionable last and in the correct form; impressions of the weight bearing portion of the foot and the outline of the foot; the method of measuring the foot, and gives directions for taking the measurements of a foot—special reference being made to a proper shoe as an aid to treatment in flat-feet. F. B. W.

GYNECOLOGY.

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GONORRHEA IN WOMEN: SOME OF ITS UNUSUAL FEATURES.

Hunner (*American Journal of Obstetrics,* Volume LV, Number III) considers some of the unusual manifestations of gonorrheal infection.

Lower Genital Tract Infections.—Stenosis of the introitus may result from scar formation. An abscess of Bartholin's gland may rupture into the bowel, forming a rectovaginal fistula.

Urinary Tract Infections.—Infection of Skene's glands is usually a serious matter. If they exude pus or become very tender they are best treated by inserting a fine probe which is depressed toward the vagina and then burning down through the anterior vaginal wall upon the probe, thus opening the gland. Suburathral abscess may form near the bladder. The treatment is the same as for abscess of Skene's gland, only here urethrovaginal fistula is liable to result, which may necessitate operative closure. Stricture of the urethra in the female, resulting from gonorrheal infection is more common, according to the writer's observation, than is generally supposed. The stricture may exist with or without inflammation of the mucosa. The treatment of stricture is preferably by gradual dilatation. Cystitis is a frequent complication of gonorrheal infection. The acute infection may pass off and leave the patient with a so-called "irritable bladder" which is usually a hyperemia of the trigonum. The author's treatment consists in the use of silver nitrate solution one to twenty per cent or protargal one to two per cent. Gonorrheal renal infection is rare, but often goes unrecognized. It may coexist with a tuberculous infection.

Upper Genital Tract Infections.—Uterine Infection: Hunner states that chronic gonorrheal endometritis is not often seen. Gonorrheal endocervicitis is, however, very common, and on account of the deep cervical gland involvement is most persistent. The treatment suggested for chronic gonorrheal endocervicitis is radial incision of the cervical canal with the actual cautery or amputation of the cervix. The conservative treatment of pus tubes is urged, as giving better results than operation.

Peritoneal Infection.—The symptoms are very much the same as in peritonitis of other origin except that the temperature rises more quickly and the disease abates faster than in the more common forms of peritoneal infection. The writer, on investigation, believes that nonoperative treatment gives the better results. However, opening the abdomen and securing free drainage may be of benefit in some cases.

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PEDIATRICS.

ARTHUR DAVID HOLMES, C. M., M. D.

THE TONSIL AS A PORTAL OF INFECTION.

Jacobi in an address before the American Pediatric Society on the tonsil as a portal of microbic and toxic invasion (*Archives of Pediatrics*, 1906, Volume XXIII, page 481). He had noted that in membranous throat affections limited to the tonsil there was little or no glandular swelling, but if it extended or began on adjacent parts the lymph nodes swelled at once. Laryngeal diphtheria also is not attended with glandular swelling or fever, probably because of the scanty network of lymphatics. After discussing the various anatomical descriptions of various writers and the possibility of the entrance of foreign material through the epithelium, even without a lesion, Jacobi concludes that microbic invasion through the tonsil is not predominant over that which takes place through the lymph apparatus of the pharynx. According to many, there is a lymph communication between the tonsil and at least one gland, situated near and below the crossing of the sternocleidomastoid and digastric muscles.

CITRATE OF SODA IN INFANT FEEDING.

Shaw (*Archives of Pediatrics*, March, 1906) gives a brief résumé of twenty-two cases, and says the results were more satisfactory than anticipated. Five babies lost in weight, of which number one died, sixteen gained, and one remained stationary. Two of the five which were reported as losing are still on citrate of soda and are now gaining steadily. In several of the cases there was an initial loss on first taking the food, but this was followed by a gradual and steady gain in most cases. One of the striking effects of the citrate was the control of the vomiting in cases of chronic gastric catarrh. Poynton found it of special service in babies suffering from dyspepsia and vomiting. The author says it will only benefit those cases in which the gastric disturbance is caused by the proteids. The stools were found to be as before, offensive, undigested and acid in reaction, but no tough casein curds were found. The citrate of soda was added to the milk mixtures in the proportion of one grain to the ounce of milk. In cases of habitual vomiting the dose was increased to three grains to the ounce. The author says in cases of proteid indigestion associated with vomiting and curds in stools, citrate of soda has a distinct therapeutic value and should receive further clinical trial.

ORTHOPEDICS.

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A CASE OF CONGENITAL ANTERIOR DISLOCATION OF THE HIP.

Doctor Edward W. Ryerson, of Chicago, discusses this subject in the *American Journal of Orthopedic Surgery*, Volume IV, Number IV.

The patient presented symptoms and signs as follows: Limb atrophy and shortening; the trochanter was five-eighths of an inch above Nelaton's line; abduction was limited; there was no pain or discomfort in the hip. The child was two years old. Labor was normal and no history of other deformities existed in the family.

The report of this case was for record only, as but seven or eight such deformities have been reported in American literature.

OPHTHALMOLOGY.

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SOME UNUSUAL OCULAR MANIFESTATIONS OF GONORRHEA.

William Campbell Posey, M. D. (*Annals of Ophthalmology*, January, 1907), reports two cases.

A male, nineteen years of age, presented many unusual features of ocular complication of gonorrhea.

After giving a detailed description of the first case the author adds the following brief recapitulation.

"To briefly recapitulate: Urethral gonorrhea in a healthy young adult; general infection as indicated by articular rheumatism; involvement of sphenoidal cells with gonococci in the discharge; a week later, gonorrheal conjunctivitis of both eyes, apparently from continuity of tissue from the sinus cells. Disappearance of ocular and nasal symptoms under treatment, but after a short period reappearance of both conditions with the added element of a typical superficial punctate keratitis in both eyes. Cure after a month of active inflammation. Three months of absence of ocular signs, followed by a double iritis with a fresh outbreak of rheumatism while taking baths for rheumatism. Disappearance of symptoms for two weeks after a month of treatment, followed by intense iridocyclitis in the left eye."

A second case was one of metastatic conjunctivitis occurring in a young adult who had urethritis complicated with gonorrheal arthritis, both lids became swollen and red, and were bathed in a mucopurulent secretion in which no gonococci were found. The cornea, at first clear, became affected in a few days in a manner to simulate superficial punctate keratitis.

The precise origin and character of the inflammation in the first case is not easy to determine. It apparently was secondary to the inflammation in the mucous membrane in the nose, although such cases are exceedingly rare. The secretion from the nose did contain gonococci. The author suggests, however, the possibility of the attack of iridocyclitis and iritis and possibly the punctate keratitis being due to a toxemia.

He follows with a historical sketch of metastatic conjunctivitis, and adds the following description, as given by White, of the clinical features of gonorrheal conjunctivitis and gonorrheal ophthalmia.

GONORRHEAL CONJUNCTIVITIS.

Produced by contagion only. Occurs once in seven hundred or eight hundred cases of gonorrhea. May be derived from a second person by pus inoculation. Involves one eye primarily. Remains limited to eye originally affected unless the other eye is accidentally affected. Symptoms affect the conjunctiva from the start. Symptoms of greatest gravity and urgency. No association with subsequent gonorrhea. No relation to joint troubles or other rheumatic manifestations. Tendency to rapid destruction of tissue involved. Treatment very useful; should be prompt and energetic.

GONORRHEAL OPHTHALMIA.

Produced probably by septicemic infection. Has no relation to direct contagion. Occurs once in fifty or sixty cases. Can occur only in a patient having urethritis. Involves both eyes usually. Frequently passes from one eye to the other. Symptoms affect the fibrous tissues, the sclerotic coat and iris. Symptoms mild, subacute. Frequently returns with each subsequent attack of gonorrhea. Most commonly found to coexist with some other form of gonorrheal rheumatism. Tendency to final but slow cure. Treatment not very effective; should be mild and expectant.

LARYNGOLOGY.

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NASAL OBSTRUCTION A CAUSE OF DEAFNESS.

TROWBRIDGE (*Annals of Otology, Rhinology, and Laryngology,* June, 1906) believes that nasal obstruction is a frequent cause of middle ear disease. After correcting the nasal obstruction the author has been gratified to find decided improvement in hearing after from two to four weeks. In cases where the deafness has not been of too long standing, or too severe a degree, the hearing became normal, in others it improved to some extent, and in still others of a more deeply seated character, he obtained no improvement in the hearing. Many cases of tinnitus were improved. In nearly all cases the patient felt the relief obtained by the improved nasal respiration. The benefit to the ear in the cases cited was obtained without any other treatment. The author does not approve of the use of the galvano-cautery in the nose on account of its limited power to remove tissue, and also on account of the severe reaction which follows its use. Preference is given to the trephine drill, operated by a motor which does not revolve too rapidly. With this drill nearly all of the bone can be removed, and the remaining soft tissue can be snipped off with a Pynchon's or Hartman's fenestrated nasal forceps. The author aims to produce a large, free, open nostril, and if this is not done we are apt not to obtain results. To cure, or materially improve middle ear catarrh, it is necessary to begin our treatment before the changes in the middle ear are advanced beyond the first stage.

PROCTOLOGY.

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THE RECTUM IN ITS RELATION TO DISEASES OF WOMEN.

HUGO PANTZER, in the *American Journal of Obstetrics,* Volume LIV, page 646, says: Experienced gynecologists are conscious of the existence of an important relation between the rectum and the female genitalia, but current literature and text-books are remarkably deficient in mentioning the fact. An altered function of one is reflected to the other organ. The contingent excitation of the rectum during menstruation may result in looseness of the bowels sufficient to require attention. Chronic constipation at times affects the quantity, frequency, and course of a menstrual flow. The author reports a case of a woman who acquired an anal fissure while straining at stool. After this had existed for one year amenorrhea developed with other symptoms of gastroenteric disturbance. Examination revealed an anterior displacement of the internal genitalia due to fecal impaction. Remedies directed exclusively to the bowel function reestablished the menses. A retardation of the rectal function with its sequel of membranous colitis, is the most frequent concomitant of genital disease. Constipation due to an hypersensitive left ovary is also met with. This causes spasticity of the rectum and retrouterine ligaments, which is the cause of the constipation. The author then enlarges upon the value of rectal examination, and points out the deviations which the rectum may sustain mainly through the occurrence associated with parturition. During plastic operations upon the genitalia some regard must be paid to restoring the rectum to its normal relations, and no one operation should be used in these cases.

RADIOLOGY.

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A NEW UNIT FOR MEASURING ROENTGEN RAYS.

Doctors H. Bordier and J. Galimaid, of Lyons, France, in the *Archives of the Roentgen Ray,* Volume XI, Number VI, review some experiments made by them with a view to establishing a unit of volume of *x*-rays based on chemical change produced by the rays.

The new unit, the authors state, is not open to some of the objections which may be made to existing units. The Holzknecht unit, for example, is defined as "one-third of the dose of Roentgen rays which is just capable of producing the first signs of reaction on the healthy skin." This unit is especially open to the objection that the sensitiveness of healthy skin varies not only with the individual but also with different parts of the body of the same individual.

The new unit is based on the decomposition of a two per cent solution of iodoform in chloroform, and is defined as "The quantity of Roentgen rays which, when falling normally on a two per cent solution of iodoform in chloroform will liberate from it one-tenth milligram of iodin, the solution being so placed that the area of the irradiated surface is one square centimeter, and the depth of the solution one centimeter. This unit the authors designate as the quantity one.

The actual quantity of iodin liberated during an exposure may be estimated either by titration with hyposulphite, or by comparing the color of the resulting irradiated solution with standard solutions of iodin in chloroform. The second method is more practical, and in accuracy varies not more than two per cent from the method of titration.

This new unit is shown to be approximately equal to 1.4 Holzknecht units. V. J. W.

NEUROLOGY.

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AND
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"THE GREAT PSYCHICAL IMPORTANCE OF EAR DISEASE."

BRYANT gives the history of four cases (*Journal of Nervous and Mental Disease*, September, 1906) in which chronic ear disease serves as the basis for the development of auditory hallucinations. The writings of other observers of this subject are considered, and the writer offers the following conclusions:

The evidence points to some connection between ear disease and hallucinations of hearing other than mere coincidence.

It is probable that hallucinations of hearing originate in subjective ear sensations in most cases.

Cure of the coincident ear disease cures or assists the convalescence from the psychoses in a notable number of cases.

Some cases of insanity appear to be excited by ear disease, and the convalescence of insane cases is delayed by the presence of ear disease.

Unilateral hallucinations of hearing are unquestionably due to unilateral ear disease. I. H. N.

EDITORIAL COMMENT.

DRUMMOND, THE FRENCH-CANADIAN DIALECT POET: A BIOGRAPHICAL SKETCH AND REVIEW.*

ONLY a few days after Thomas Bailey Aldrich said, "In spite of all I am going to sleep—put out the lights," William Henry Drummond passed over "the last portage."

'Off on de road he was never see.'

He died of paralysis in Cobalt, Ontario, on the 6th of April, where he had gone to attend and rescue some smallpox patients out in a mining camp. When he started, he was quite weak from having taken a cold, but like the martyr priest, Damien, his friend, on an errand of mercy and benevolence, was "death-smitten in the prime of his fair life," for he was yet young, only fifty-three, was just reaching the height of his fame and popularity, and much was expected from his pen.

Weak though he was, he attended a dinner in Montreal on the 17th of March and read a new poem he had written for the occasion. A

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few days afterward he hastened to Cobalt, Ontario, to save the lives of some of the men on his mining claim, and there, after more than a week's suffering, met his death, just after he had finished his work and reported to his family that the place would soon be out of quarantine and that he would then start for home.

He was born in the county of Leitrim, Ireland, in 1854, and came to this country when a boy of fifteen, with a fair primary education. He graduated at the High School in Montreal, McGill University, and Bishop's College, in which last-mentioned institution he was Professor of Medical Jurisprudence. He practised medicine in Montreal since 1884, was a popular lecturer and reader, and of late years was manager and chief owner of the Drummond mines in Cobalt. He was a member of the Royal Society of Canada, and an LL.D. of Toronto University. In 1898 he was elected a Fellow of the Royal Society of Literature for England. During his college days at "McGill" and "Bishop's" he was well known throughout the country as an athlete, particularly as heavy hammer thrower, and three-mile champion runner of Canada. Even at this time he wrote occasional pieces of verse which he never preserved; oftentimes the only copies he had were borrowed by fellow-students and lost, so that frequently in after years he saw his poems reproduced by others, as was notably the case with one of his best known pieces, "Wreck of Julie Plante."

Coincident with his love for the lakes, woods, and folk-lore of Canada, was the romance of his marriage to Miss May Isabel Harvey, the daughter of Octavius C. Harvey, with whom she came from Jamaica to make a hunting tour and vacation stay at the Laurentian Club. There they fished and hunted together, "wid good chance for get acquaint." After their marriage, it was she who gathered and arranged such fragments of his writings as she could obtain, and was thus largely if not wholly instrumental in bringing them to the notice of publishers. The stories of "The Habitant," "Johnnie Courteau," and more especially "The Voyageur" are now considered as being among the treasures of Canadian literature, and since 1886 Drummond has been in demand as a lecturer and reader both in the United States and Canada.

Doctor Drummond practised his profession in Montreal, but had lived in typical Canadian villages among farmers, lumbermen, fishermen, voyagers and miners of the French-Canadian race, mingled with English, Scotch and Indians, who were mostly all familiar with the French patois and broken English dialect which he has so faithfully portrayed in that peculiar and pleasing jargon of the woodsman, the stream driver and the common "habitant" of the Canadas. He knew their songs, was conversant with their homely joys and industrious occupations. He drove logs with them, ran the rapids, cut timber, cord-wood and bark with them for amusement, exercise, and sport. He rowed their canoes, fished and shot with them on nearly all the rivers of Quebec, all the time most carefully noting their interesting traits, their peculiarities of dialect, their unique philosophy and native French witticisms. He became thoroughly imbued with an intuitive love for their simple syllables and quaint accents, which he soon learned to adapt and weave into such delightful rythmical verse. For the past fifteen years it has made his name most favorably known as one of Canada's foremost writers, the habitant poetry being much appreciated and admired throughout this country. For many seasons he has sailed his craft and red cedar canoe on the Saint Lawrence river and its tributaries for fish, gone into the wilderness for game, met the habitant farmer at his plough, visited the "log-cabane, down on de valley"—

'Were de camp is warm and de fire bright,
An' de bottle is close at han'.'

It was, I think, about the year of 1880 that he met the wood-scow sailor man who said, "De win' she's blow, blow! blow!" and from this he took the chords of the well-known Canadian song, "Wreck of Julie Plante." I read it then in a Montreal paper and committed it to memory. The humorous moral of the tragedy has always greatly amused me.

'You can't get drown on Lac St. Pierre,
So long you stay on shore.'

For quite a long period the authorship of "Julie Plante" was not generally known. Not until several other very bright and clever French dialect poems came forth, was it known that in Doctor Drummond, Canada possessed a real original French dialect poet. Others had personified and portrayed native traits and dialects in this country, but none "The Habitant." Drummond was the creator, and in estimating his literary worth as such, no one wishes that he has not been someone else; there has been no one else. Through all his work there runs a clear, warm stream of charming pathos, just as may be traced through the dialect pieces of Joel Chandler Harris and George W. Cable. None of his first poems were written for publication, but rather for his own amusement and for the love he had for creating something original and unique—unlike anything produced before. We had read Rowland Robinson and Sir Gilbert Parker where some French-Canadian dialect is introduced into their stories, but the master's touch is not there. Drummond's art was not only exercised with power and fidelity, but with a pathos and delicacy which were peculiarly his own, and peculiarly identified with the people's manners and the French-English dialect of Canada. Delighted readers very soon compelled the doctor to continue his efforts from time to time, until he added to his collection a sufficient number to comprise four books of verse, published at different dates since 1890, all of which may now be procured in any part of this continent. Such an object of interest has "The Habitant" become that it has been reprinted more than twenty-five times and another edition is now in progress. No one before Drummond had ever understood this character, or realized the habitant's simple, honest nature, and his love for the good and beautiful.

Hitherto but one other writer has made any mark in using the French-English dialect in prose. That was the late Rowland Robinson, author of "Danvis Folks" and "Sam Lovell's Boy," but he introduced it in connection with Yankee hayseed talk, as heard in Vermont, whereas Drummond, having a thorough knowledge of French, was well adapted to reproduce the pleasing, humorous jargon of the woodsmen, rivermen, and common habitant farmer, in the form of those charming, gay, artless, realistic and delicate verses, possessing such fine and appropriate taste, and such sweetness of cadence. While it is not the mother tongue of either French or English, he has made it most touching, and the people are pleased to hear the songs in a dialect which they love, and which is neither English nor French. Drummond, from his boyhood, understood, and was in sympathy with, those kind-hearted people that speak it, and he fully appreciated their peaceful and pious natures. In his first preface he tells us that he "grew to admire and love them and their life," bound up as it was with the woods and waters, and the freedom of the winds. The subtle charm of their dialect made it the best possible medium for their delineation by the poet. It would also seem that the subjects of his verse are not slow in appreciating their own portrayal, for the books are freely bought by them, and may be found in thousands of log cabins throughout the Dominion.

The *"habitant"* knows and feels that none of the verses were ever intended to cast ridicule upon his people in any sense, and it is obvious to all that no such thought ever occurred to Drummond, for one does not have to read very far to discover, that in his lines there is something that strikes far deeper than either ridicule or humor, and that his motive was sincere and salutary. Though his work differed greatly from any American poet, his verses being of a class by themselves, and of a kind that have opened a new field in American literature, yet, he will take rank among those Canadians who have by their poetic art caused us to feel, hear, and see, more divinely. Drummond's name will endure and hold an unquestioned place with the names of those poets whose fame has added to the renown of Canada, and to the youth, beauty, and vigor of her literature.

* * *

His medical career was eminently successful. In the science of Medical Jurisprudence he was most proficient, but it is evident that his most congenial pursuits were those of authorship, lecturing, and being on the waters and in the wilderness, enjoying nature's solitudes under bright and dancing sunbeams, and the living tinges of the changing blue and silver-tinted sky. He loved these for the best they had to give. He seems to have had a natural aptitude for literature. The best evidence of his poetic ability and talent is shown in his last book, "The Voyageur." While "Julie Plante" and "The Habitant" brought him into popular notice, they were both completely overshadowed by his subsequent efforts, and it may be truthfully said that in reality, the most entertaining and amusing of his poetic effusions, although so effective, were the least finished; and some of the more recent minor pieces are exquisite in delicacy of native force and sentiment.

In putting forth his first book, "The Habitant," he struck a vein which we regard with surprise and delight, as being at once original and vigorous, and it reached the expression of the people as being the first real French-Canadian book of verse. It made Drummond a poet of two Canadian peoples, founding as it were, a sort of national poetry, and causing the French-English dialect itself, to appear more artistic and unique, thereby removing a certain ban that had been placed upon it in literature. The simple imagery and expression of "The Habitant" resembles Norman French, although their patois is very different, both in speech and orthography, the Canadian-French blending in much better euphony with our American-English, so both patois and dialect are essentially American, rather than European. Drummond's writings as yet could not be well and properly appreciated in any part of Europe. There are also certain Indian features or elements in "The Habitant" speech and comparisons which they draw from waters, clouds, fields and forests, belonging essentially to the country which nature has bounded by great lakes and rivers, the sources and tributaries of which, both the Frenchman and the Indian have so nicely and appropriately named. Drummond's verse could not have been written in Europe, any more than the Psalms could have been produced in Northern Russia.

* * *

Drummond may be said to have mastered a perfect knowledge of all this which previously had not existed in written form, although the speech had been in use for over two hundred years, and he made it most admirably adapted for recitation, which is a fine test of the emotional power of poetry. He has extracted from it a mixed meaning and expression, possessing shades of sense and signification that are lost in modern French, and not attained in ordinary English phrase. Although a scholar, he made no successful efforts in classical French. He liberated himself from every school—to place himself on the plane with Nature and "The Habitant" life, making himself the pioneer spokesman of a new poetry, and adapting his literature to both races in Canada. He cared nothing for style, yet the natural and easy grace of his best work has been much praised. The *Century* and many other leading magazines have always been eager to publish his pieces, showing that his skill was recognized because his perception and portrayal of "habitant" character was intuitive and strong.

It is the American people, rather than critics, who will give him his place in literature; the people who have insisted upon hearing this author render those quaint, humorous and pathetic productions of realism, which I venture to say, will ever be found picturesque and amusing, and ever command popular favor.

* * *

We are naturally and irresistibly attracted to his famous poem, "The Voyageur," because it seems to give the most spirit and color to his verse. It suggests that indomitable French pluck of the old wanderers, couriers-de-bois, and explorers of the Eighteenth Century in the great Canadian Northwest, "the men of iron."

'Born w'ere de mountain scrape de sky,
An' bone of my fader and moder lie.

. . . .

Proud of de sam blood in my vein,
I'm a son of de Nort' Win' wance again.'

Here, we feel the real stimulating march of his song, and the old rustic dialect is at once raised to the level of true literature, resounding with tones of keenest pathos.

VOYAGEUR.

'Dere's somet'ing stirrin' ma blood to-night,
On de night of de young new year,
W'ile de camp is warm an' de fire is bright,
An' de bottle is close at han'—
Out on de reever de nort' win' blow,
Down on de valley is pile de snow.
But w'at do we care so long we know
We're safe on de log cabane?

'Drink to de healt' of your wife an' girl,
Anoder wan for your frien',
Den geev' me a chance, for on all de worl'
I've not many frien' to spare—
'I'm born w'ere de mountain scrape de sky,
An' bone of ma fader an' moder lie,
So I fill de glass an' I raise it high,
An' drink to de Voyageur.

'For dis is de night of de jour de l'an,[1]
W'en de man of de Grand Nor' Wes'
T'ink of hees home on de St. Laurent,
An' frien' he may never see—
Gone he is now, an' de beeg canoe
No more you'll see wit' de red-shirt crew,
But long as he leev' he was alway true,
So we'll drink to hees memory.

'Ax' heem de nort' win' w'at he see
Of de voyageur long ago,
An' he'll say to you, w'at he say to me,
So lissen hees story well—
"I see de track of hees botte sau-vage[2]
On many a hill an' long portage
Far far away from hees own vill-age
An' soun' of de parish bell—

---

[1] New Year's day.
[2] Indian boot.

'I never can play in de Hudson Bay
Or mountain dat lie between
But I meet heem singin' hees lonely way
De happies' man I know—
I cool hees face as he's sleepin' dere
Under de star of de Red Revière,
An' off on de home of de great w'ite bear,
I'm seein' hees dog traineau.[3]

'De woman an' chil'ren's runnin' out
On de wigwam of de Cree—
De leetle papoose dey laugh an' shout
W'en de soun' of hees voice dey hear—
De oldes' warrior of de Sioux
Kill hese'f dancin' de w'ole night t'roo,
An de Blackfoot girl remember too
De ole tam Voyageur.

'De blaze of hees camp on de snow I see,
An' I lissen hees 'En Roulant'
On de lan' w'ere de reindeer travel free,
Ringin' out strong an' clear—
Offen de grey wolf sit before
De light is come from hees open door,
An' caribou foller along de shore
De song of de Voyageur.

'If he only kip' goin', de red ceinture,
I'd see it upon de pole
Some mornin' I'm startin' upon de tour
For blowin' de worl' aroun'—
But w'erever he sail an' w'erever he ride,
De trail is long an' de trail is wide,
An' city an' town on ev'ry side
Can tell of hees campin' groun'.'

'So dat's de reason I drink to-night
To de man of de Grand Nor' Wes',
For hees heart was young, an' hees heart was light
So long as he's leevin' dere—
I'm proud of de sam blood in ma veen,
I'm a son of de Nort' Win' wance again—
So we'll fill her up till de bottle's drain
An' drink to de Voyageur!'

* * *

"Leetle Lac Grenier" is a quaint poem, the recitation of which gave Doctor Drummond much popularity at many University and literary banquets. It was on this solitary lake, with his guide, tent and canoe, that he found his most favorite recreation with rod and gun.

LITTLE LAC GRENIER.

'Leetle Lac Grenier, she 's all alone,
Right on de mountain top,
But cloud sweepin' by, will fin' tam to stop
No matter how quickly he want to go,
So he 'll kiss leetle Grenier down below.

---

[3] Dog-sleigh.

'Leetle Lac Grenier, she 's all alone,
Up on de mountain high,
But she never feel lonesome, 'cos for w'y?
So soon as de winter was gone away
De bird come an' sing to her ev'ry day.

'Leetle Lac Grenier, she 's all alone,
Back on de mountain dere,
But de pine tree an' spruce stan' ev'rywhere
Along by de shore, an' mak' her warm,
For dey kip off de win' an' de winter storm.

'Leetle Lac Grenier, she 's all alone,
No broder, no sister near,
But de swallow will fly, an' de beeg moose deer
An' caribou too, will go long way
To drink de sweet water of Lac Grenier.

'Leetle Lac Grenier, I see you now,
Onder de roof of spring.
Ma canoe 's afloat, an' de robin sing,
De lily 's beginnin' her summer dress,
An' trout 's wakin' up from hees long long res'.

'Leetle Lac Grenier, I'm happy now,
Out on de ole canoe,
For I'm all alone, ma chere, wit' you,
An' if only a nice light rod I had
I'd try dat fish near de lily pad!

'Leetle Lac Grenier, O! let me go,
Don't spik no more,
For your voice is strong lak de rapid's roar,
An' you know youse'f I'm too far away,
For visit you now—leetle Lac Grenier!'

* * *

"The Habitant," the poem that gave the name to his first volume, about fourteen years ago, is probably the best known, being one of the earliest. Up to the time it was written no one had presented this "rude but honest Canayen," his quaintness and sturdiness, always natural, genuine and true. This poem excites and creates a most happy sense of humor, being full of those little graphic incidents of their life, which so delighted Drummond to discover and portray. In illustration, the following stanzas only are given.

'W'en I got plaintee hay put away on de stable
So de sheep an' de cow, dey got no chance to freeze,
An' de hen all togedder—I don't min' de wedder—
De nort' win' may blow jus' so moche as she please.

'An' some cole winter night how I wish you can see us,
W'en I smoke on de pipe, an' de ole woman sew
By de stove of T'ree Reever—ma wife's fader geev her
On day we get marry, dat's long tam ago—.

'De boy an' de girl, dey was readin' it's lesson,
De cat on de corner she's bite heem de pup,
Ole "Carleau" he's snorin' an' beeg stove is roarin'
So loud dat I'm scare purty soon she bus' up.

'Philomene—dat's de oldes'—is sit on de winder
An' kip jus' so quiet lak wan leetle mouse,
She say de more finer moon never was shiner—
Very fonny, for moon isn't dat side de house.

'But purty soon den, we hear foot on de outside,
An' some wan is place it hees han' on de latch,
Dat's Isidore Goulay, las fall on de Brulé,
He's tak' it firs' prize on de gran' ploughin' match.

'Ha! ha! Philomene!—dat was smart trick you play us,
Come help de young feller tak' snow from hees neck,
Dere's not'ing for hinder you come off de winder
W'en moon you was look for is come, I expec'—.

'Isidore, he is tole us de news on de parish
'Bout hees Lajeunesse Colt—travel two-forty, sure,
'Bout Jeremie Choquette, come back from Woonsocket
An' t'ree new lettle twin on Madame Vaillancour.

'But nine o'clock strike, an' de chil'ren is sleepy,
Mese'f an' ole woman can't stay up no more,
So alone by de fire—'cos dey say dey ain't tire—
We lef' Philomene an' de young Isidore.

'I suppose dey be talkin' beeg lot on de kitchen
'Bout all de nice moon dey was see on de sky—
For Philomene's takin' long tam get awaken
Nex' day, she's so sleepy on bote of de eye.'

* * *

The "Bell of Saint Michel" he seems to have composed as only one could who had thoroughly set his heart upon it. There is in this a tenderness and devotion surpassing many of the fine poems on love of home sentiment. Only four stanzas are given.

BELL OF ST. MICHEL.

'Go 'way, go 'way, don't ring no more, ole bell of Saint Michel,
For if you do, I can't stay here, you know dat very well,
No matter how I close ma ear, I can't shut out de soun',
It rise so high above all de noise of dis beeg Yankee town.

'An' w'en I t'ink I feel de cool, cool summer breeze
Dat 's blow across Lac Peezagonk, an' play among de trees,
Dey're makin' hay, I know mese'f, can smell de pleasant smell,
O! how I wish I could be dere to-day on Saint Michel!

. . . .

'It's very strange about dat bell, go ding dong all de w'ile,
For when I'm small garcon at school, can't hear it half a mile;
But seems more fader I get off from Church of Saint Michel
De more I see de ole village an' louder soun' de bell.

'O! all de monee dat I mak' w'en I be travel roun'
Can't kip me long away from home on dis beeg Yankee town,
I t'ink I'll settle down again on Parish Saint Michel,
An' leev an' die more satisfy so long I hear that bell.'

* * *

The wreck of "Julie Plante" is the best known of all. A song of the sea, to illustrate that the Lac Saint Piere mariner is exposed to no less violent tornadoes, tempests, hurricanes and dangers than his brother of the "vasty deep." Also showing the fine nautical skill of the courageous capitaine, and the submissive endurance, patience, and resignation of the heroine.

WRECK OF THE JULIE PLANTE.

'On wan dark night on Lac St. Pierre,
De win' she blow, blow, blow,
An' de crew of de wood scow "Julie Plante"
Got scar't an' run below—
For de win' she blow lak hurricane
Bimeby she blow some more,
An' de scow bus' up on Lac St. Pierre
Wan arpent from de shore.

'De captinne walk on de fronte deck,
An' walk de hin' deck too—
He call de crew from up de hole,
He call de cook also.
De cook she's name was Rosie,
She come from Montreal,
Was chambre maid on lumber barge,
On de Grande Lachine Canal.

'De win' she blow from nor'-eas'-wes',
De sout' win' she blow too,
W'en Rosie cry "Mon cher captinne,
Mon cher, w'at I shall do?"
Den de captinne t'row de big ankerre,
But still the scow she dreef,
De crew he can't pass on de shore,
Becos' he los' hees skeef.

'De night was dark lak' wan black cat,
De wave run high an' fas',
W'en de captinne tak 'de Rosie girl
An' tie her to de mas'.
Den he also take de life preserve,
An' jomp off on de lak',
'An' say 'Good-bye, ma Rosie dear,
I go drown for your sak'."

'Nex' morning very early
'Bout ha'f-pas' two—t'ree—four—
De captinne—scow—an' de poor Rosie
Was corpses on de shore,
For de win' she blow lak' hurricane,
Bimeby she blow some more,
An' de scow bus' up on Lac St. Pierre,
Wan arpent from de shore.

MORAL.

'Now all good wood scow sailor man
Tak' warning by dat storm
An' go an' marry some nice French girl
An' leev on wan beeg farm.
De win' can blow lak' hurricane
An' s'pose she blow some more,
You can't get drown on Lak St. Pierre
So long you stay on shore.'

NOTE.—The lake which claims the legend is but an expansion of the St. Lawrence below Montreal for about twelve or fifteen miles, and is about eight or nine miles across. At some seasons of the year, its depth in most places would not be much more than twelve feet.

* * *

"When Albani Sang." One of the famous examples of Drummond's entertaining ability, was his most happy and appropriate tribute to "Albani" (*"The Chambley girl"*), in 1902, at the dinner in New York given on the return of that native Canadian singer from her continental tour. Jerome and Antoine attend the splendid reception *"on de city."* Only the last six stanzas are given.

WHEN ALBANI SANG.

'Dat song I will never forget me, 't was song of de leetle bird,
W'en he's fly from it's nes' on de tree top, 'for res' of de worl' get stirred.
Ma-dam she was tole us about it, den start off so quiet an' low,
An' sing lak de bird on the morning, de poor leetle small oiseau.

'I 'member wan tam I be sleepin' jus' onder some beeg pine tree
An' song of de robin wak' me, but robin he don't see me.
Dere 's not'ing for scarin' dat bird dere, he's feel all alone on de worl',
Wall! Ma-dam she mus' lissen lak dat too, w'en she was de Chambly girl!

''Cos how could she sing dat nice chanson, de sam' as de bird I was hear,
Till I see it de maple an' pine tree an' Richelieu ronnin' near;
Again I'm de leetle feller, lak young colt upon de spring
Dat's jus' on de way I was feel, me, w'en Ma-dam All-ba-nee is sing!

'An affer de song it is finish, an' crowd is mak' noise wit' its han',
I s'pose dey be t'inkin' I'm crazy, dat mebbe I don't onderstan'.
Cos I'm set on de chair very quiet, mese'f an' poor Jeremie,
An' I see dat hees eye it was cry, too, jus' sam' way it go wit' me.

'Dere 's rosebush outside on our garden, ev'ry spring it has got new nes',
But only wan bluebird is buil' dere, I know her from all de res',
An' no matter de far she be flyin' away on de winter tam,
Back to her own leetle rosebush she's coming der jus' de sam'.

'We're not de beeg place on our Canton, mebbe cole on de winter, too,
But de heart's "Canayen" on our body, an' dat 's warm enough for true!
An' w'en All-ba-nee was got lonesome for travel all roun' de worl'
I hope she'll come home, lak de bluebird, an' again be de Chambly girl!'

* * *

In the "Curé of Calumette" is portrayed veneration for the Church and love amounting to adoration for the parish priest. The first three and the last three verses only are given.

CURÉ OF CALUMET

'Dere's no voyageur on de reever never run hees canoe d'ecorce
T'roo de roar an' de rush of de rapide, w'ere it jump lak a beeg w'ite horse,
Dere 's no hunter man on de prairie, never wear w'at you call racquette
Can beat leetle Fader O'Hara, de Curé of Calumette.

'Hees fader is full-blooded Irish, an' hees moder is pure Canayenne,
Not offen dat stock go togedder, but she's fine combination ma frien',
For de Irish he's full of de devil, an' de French dey got savoir faire,
Dat's mak' it de very good balance an' tak' you mos' ev'ry w'ere.

'But dere's wan t'ing de Curé won't stan' it; mak fun on de Irlandais
An' of course on de French wa say not'ing, 'cos de parish she's all Canayen,
Den you see on account of de moder, he can't spik heesef very moche,
So de ole joke she's all out of fashion, an' wan of dem t'ing we don't touch.

. . . .

'I dunno if he need our prayer, but we geev' it heem jus' de same,'
For w'en a man's doin' hees duty lake de Curé do all de tam
Never min' all de t'ing may happen, no matter he's riche or poor
Le bon Dieu was up on de heaven, will look out for dat man,' I'm sure.

'I'm only poor habitant farmer, an' mebbe know not'ing at all,
But dere's wan t'ing I'm alway wishin', an' dat's w'en I get de call
For travel de far-away journey, ev'ry wan on de worl' mus' go
He'll be wit' me de leetle Curé 'fore I'm leffin' dis place below.

'For I know I'll be feel more easy, if he's sittin' dere by de bed,
An' he'll geev' me de good-bye message, an' place hees han' on ma head
Den I'll hol' if he'll only let me, dat han' till de las' las' breat'
An' bless leetle Fader O'Hara, de Curé of Calumettte.'

* * *

"Johnnie Courteau" represents the gay and belligerent river man. It is a droll, humorous piece of verse, the name being the title of his second volume. The author very frequently recited it at entertainments, and it seemed to be his favorite. It is a most faithful portrayal of the French-Canadian character on the rivers. There is a vigorous "jomp an' run" go to it which carries us away, as it must have carried Drummond away when he wrote it. He was in very close association with these men on the drives, and it must have been most stimulating and refreshing to have heard him recite the following:

'Johnnie Courteau of de mountain
Johnnie Courteau of de hill
Dat was de boy can shoot de gun
Dat was de boy can jomp an' run
An' it's not very offen you ketch heem still
Johnnie Courteau!

'Ax dem along de reever
Ax dem along de shore
Who was de mos' bes' fightin' man
From Managance to Shaw-in-i-gan?
De place w'ere de great beeg rapide roar,
Johnnie Courteau!

'Sam t'ing on ev'ry shaintee
Up on de Mekinac
Who was de man can walk de log,
W'en w'ole of de reever she's black wit' fog
An' carry de beeges' load on hees back?
Johnnie Courteau!

'On de rapide you want to see heem
If de raf' she's swingin' roun'
An' he's yellin' "Hooraw Bateese! good man!"
W'y de oar come double on hees han'
W'en he's makin' dat raf' go flyin' down,
Johnnie Courteau!

. . . .

'An' he only have pike pole wit' heem
On Lac a la Tortue,
W'en he meet de bear comin' down de hill,
But de bear very soon is get hees fill!
An' he sole dat skin for ten dollar too,
Johnnie Courteau!

'Oh he never was scare for not'ing,
Lak de ole coureurs de bois,
But w'en he's gettin' hees winter pay
De bes' t'ing sure is kip out de way
For he's goin' right off on de Hip Hooraw!
Johnnie Courteau!

. . . .

'But Johnnie Courteau get marry
On Philomene Beaurepaire,
She's nice leetle girl was run de school
On w'at you call Parish of Sainte Ursule
An' he see her off on de pique-nique dere,
Johnnie Courteau!

'Den somet'ing come over Johnnie
W'en he marry on Philomene
For he stay on de farm de w'ole year roun'
He chop de wood an' he plough de groun'
An' he's quieter feller was never seen,
Johnnie Courteau!

'An' ev'ry wan feel astonish
From La Tuque to Shaw-in-i-gan
W'en dey hear de news was goin' aroun'
Along on de reever up an' down
How wan leetle woman boss dat beeg man
Johnnie Courteau!'

* * *

"The Rivière des Prairies" has a marked popularity on both sides of the Great Lakes, and even in places where the dialect is not familiar, it being easily appreciated. A portion of it is given:

'I see de many reever on de State an' ev'ryw'ere,
From Maine to California, New York to Michigan,
An' wan way an' de oder, I tell you I don't care;
I travel far upon dem as moche as any man—
But all de t'ousan' reever I was never pass along,
For w'at they call de beauty, from de mountain to de sea,
Dere's wan dat I be t'inkin', de wan w'ere I belong,
Can beat dem all, an' easy, too, de Rivière des Prairies!

'Missouri! Mississippi! better wait till you go back—
No tam for talk about dem w'en dis reever you can see,
But watch de cloud a-sailin' lak a racer on de track,
An' lissen to de music of de Rivière des Prairies—
An' up along de shore dere, don't you envy Bord à Plouffe?
Oh! dat's de place is lucky, have de reever come so near—
I'm knowin' all de people, ev'ry chimley, ev'ry roof,
For Bord à Plouffe she never change on over feefty year!

'St. Martin's bell is ringin', can't you hear it easy now?
Dey're marryin' or buryin' some good ole frien' of me,
I wonder who it can be, don't matter anyhow,
So long as we're a-lookin' on de Rivière de Prairies.
Only notice how de sun shine w'en he's comin' out to peep,
I'm sure he's lettle brighter dan anyw'ere you see,
An' w'en de fall is over, an' de reever's gone to sleep,
De w'ites' snow is fallin' on de Rivière des Prairies!

'I love you, dear ole reever, more dan ev'ry Yankee wan;
An' if I get de money, you will see me on de train,
Wit' couple o' t'ousan' dollar, den hooraw; it's good-bye, John!
You can kill me if you ketch me leavin' Bord à Plouffe again.
But sometam it'll happen dat a feller's gettin' stop
Because he's comin' busy wit' de wife an' familee—
No matter, if de good God he won't forget to drop,
Ev'ry day an' night, hees blessin' on de Rivière des Prairies!

* * *

The writer, without quoting any of the stanzas, would here refer to "Le Vieux-Temps" as a masterpiece of his poetic vision. It is so perfectly true to life, and touches a tender and sympathetic chord, which gives us a recognition of the true spiritual character of the "habitant."

The reader is also referred to "Leetle Bateese" as being, if anything, the most delicate and delightful picture he has drawn. It shows in such clear light the natural affection of the old *grand pere,* who says in closing.

'Leetle Bateese! please don't forget
We rader you're stayin' de small boy yet,
So chase de chicken an' mak' dem scare
An' do w'at you lak' wit' your ole gran'-pere,
For when you're big faller he won't be dere.'

The pictures of Courteau, Camille, The Curé, Bateese, Jeremy, and Antoine, will long survive.

* * *

"The Last Portage" commemorates the poet's own son, and appeared in "The Voyageur" in 1906. There is soul-life in the poetical glory of this "dream."

'I'm sleepin' las' night w'en I dream a dream
An' a wonderful wan it seem—
For I'm off on de road I was never see,
Too long an' hard for a man lak me,
So ole he can only wait de call
Is sooner or later come to all.

'De night is dark an' de portage dere
Got Plaintee o' log lying ev'ryw'ere,
Black bush aroun' on de right an' lef',
A step from de road an' you los' you'se'f,
De moon an' de star above is gone,
Yet somet'ing tell me I mus' go on.

'An' off in front of me as I go,
Light as a dreef of de fallin' snow—
Who is dat leetle boy dancin' dere
Can see hees w'ite dress an' curly hair,
An' almos' touch heem, so near to me
In an' out dere among de tree?

'An' den I'm hearin' a voice is say,
"Come along, fader, don't min' de way,
De boss on de camp he sen' for you,
So your leetle boy 's going to guide you t'roo.
It 's easy for me, for de road I know,
'Cos I travel it many long year ago."

'An' oh! mon Dieu! w'en he turn hees head
I'm seein' de face of ma boy is dead—
Dead wit' de young blood in hees vein—
An' dere he's comin' wance more again
Wit' de curly hair, an' dark-blue eye,
So lak de blue of de summer sky—

'An' now no more for de road I care,
An' slippery log lyin' ev'ryw'ere—
De swamp an de valley, de mountain too,
But climb it jus' as I use to do—
Don't stop on de road, for I need no res'
So long as I see de leetle w'ite dress.

'An' I foller it on, an' wance in a w'ile
He turn again wit' de baby smile,
An' say, "Dear fader, I'm here you see,
We're bote togeder, jus, you an' me—
Very dark to you, but to me it 's light,
De road we travel so far to-night.

'"De boss on de camp w'ere I always stay
Since ever de tam I was go away,
He welcome de poores' man dat call,
But love de leetle wan bes' of all,
So dat's de reason I spik for you
An' come to-night for to bring you t'roo."

'Lak' de young Jesu w'en he's here below
De face of ma leetle son look jus' so—
Den off beyon,' on de bush I see
De w'ite dress fadin' among de tree—
Was it a dream I dream las' night
Is goin' away on de morning light?'

* * *

In selecting the foregoing extracts from the author's books the writer has been guided only by his own choice, and has given preference to a few poems which appealed to him as being sufficient to present the varied phases of his talent, the grave, the humorous, the pathetic, and emotional are revealed, the latter of course being the principal element which makes a poem.

It will be observed that Drummond followed so closely the "habitant" thought and expression, and entered so intimately into their lives, that the mixed dialect used by them in speaking English unconsciously became as natural as though he were one of them. He was quick in perceiving their native ingenuity of construction, and their artless freedom, confidence, and rapidity of utterance, always expressing such gaiety and keenness of humor, the latter imparting to the dialect such quaint and fanciful originality, always alive and inspiring, full of artless grace and naivete. The admirable delicacy and charming frankness displayed in his best work is without doubt the result of intuition; he was the poet of instinct rather than of art, and has handled this rustic dialect with such spirit and power of fascination that, apparently without effort, he carries us away with the "habitant" along the shores of Canadian lakes and rivers, over grand slopes of mountains, through vast prairies and under green trees, where we may breathe in more perfect freedom and vigor, the strength, freshness, and fragrance of the great North winds.

His "Last Portage," like Tennyson's "Crossing the Bar," appeals now to us as being prophetic of the "call,"

'Is sooner or latter come to all.'

. . . .

'For travel de far-away journey, ev'ry wan on de worl' mus' go.'

He has crossed the portage and left behind him a noble contribution to literature.

JOSEPH A. HARRIS.

ANNOTATIONS.

TRYPSIN FINALLY TABLED.

THE employment of trypsin in cancer seems doomed to suffer the oblivion of many other so-called specifics. The recent experiments of Beard and Saleeby promised to revolutionize the treatment of this disease, and while these investigators apparently achieved a degree of success with the treatment, late experiences have demonstrated the inefficiency of the remedy. The admonition of the late Sir William M. Banks—"Attack the disease at its earliest appearance, remove it thoroughly, and closely watch the case for evidence of recurrence"—is, in the light of past experiences, worthy of respect.

THE GROWTH CYCLE IN THE GENESIS OF CANCER.

RIBBERT, of the University of Bonn, has lately ventured some speculations regarding the etiology of carcinoma. In this disease he was confronted by the problem why certain cells migrate from their normal position and form tissue utterly foreign to the contiguous structure. Experiment has led him to the belief that cancer development is preceded by a prodromal stage in which an increased formation of epithelial cells occurs, together with alternative changes in the subepithelial connective tissue. These changes may originate in a circumscribed embryonal disturbance or in an inflammation of the epithelium, causing the existence of a pathologic condition between epithelial cells and connective tissue cells. During this stage spores from the epithelium penetrate the underlying connective tissue and result in the genesis of carcinoma. These spores are the product of an abnormal tissue and bear no functional relationship to the subtissue; hence their growth is independent, and as development ensues they gradually become more foreign to the normal structure, and finally assume the nature of a parasitic body.

BERTHELOT PASSES BEYOND.

In the recent death of Marcellin Berthelot, science lost one of its most eminent workers in the domain of organic chemistry. He was a man of vast learning and great concentration, and that his endeavors were appreciated is attested by numerous tributes of esteem which the French government conferred upon him. The son of a French physician, the atmosphere which he breathed created an intense scientific yearning and early induced him to study chemistry. In 1851 he was appointed to the chair of organic chemistry in the College of France, and in 1861, when but thirty-four years of age, the Academy of Sciences awarded him the Joecker prize for research in chemical synthesis. His reply to the manufacturer who offered him partnership if he would solve a method for the cheaper extraction of saccharine from molasses is characteristic of the true scientist—"I work for the state (people) and cannot be party to any patenting arrangement."

THE DIREFUL PROPERTIES OF DUST.

Homan is of the opinion that so long as disregard is manifested for the prevalence of house dust as a factor in tuberculosis, effort to eradicate the disease will prove futile. Experiment has demonstrated that the spark of virility remains dormant within the desiccated cell for long, ready to erupt at favorable opportunity and produce clinical expression of the disease. Any method of cleaning which tends to disseminate dust is condemned, and the contention is advanced that hotels, schools, churches, and public buildings generally, should be required by law to introduce dustless methods of cleaning. In connection with the question of dust as a disease transmitter it is interesting to note a novel idea adopted by some of the municipalities of England. Owing to augmented motor traffic, and consequent increase of dust, the roadways were sprinkled with calcium chlorid, which, owing to its hygroscopic properties, rendered them moist for considerable period. However, the practicality of this agent has not yet been determined, since in solution it closely resembles acid, attacking iron and other metals, while its effect on rubber tires and the feet of horses and animals might be equally injurious.

OBSERVATIONS RESPECTING THE NATIVE OPOSSUM.

FURNISS describes the American opossum and concludes that the species closely resembles the Australian marsupialia. The opossum is an implacental mammal, the young being delivered in a very small and immature state, subsequently attached to the teats of the mother and carried in a pouch until covered with hair, milk being periodically ejected into the mouth by contractions of the strong compressor teat muscles. That the embryologic development of the genitourinary tract in this animal is dissimilar to that of other mammals is evident from the fact that the glans penis is bifurcated, the urethra opening in the center. The uterus is developed from the Müllerian ducts which are apparent in the fifth week of pregnancy. In the second month they unite near their centers; and about the fourth month they blend in their lower parts; while in the fifth month the cervix is distinguishable. A divergence of the ducts forms the Fallopian tubes. The anus and urogenital fissure are surrounded by a common sphincter.

MEDICAL NEWS.

A MEDICAL ANANIAS CLUB.

THE following correspondence indicates that politicians, magazine writers, and trust magnates are not the only people worthy of election to the Ananias Club:

BIRMINGHAM, ALABAMA.

DEAR DOCTOR BLANK:

THERE is a doctor here who says he has been, or is, one of the professors of the University of ————. He is injecting goat juice into the people of Birmingham. Now if there is one thing this community does not need more of, it is "goat power." I simply want to enter a complaint against your university and have this man called back home. There is a law in this State that requires a man to pass an examination before he can practice medicine, but we are afraid to force this medicine man to an examination as our legislators are old men, with goat power on the wane, and may have the law repealed.

————.

DEAR DOCTOR:

I am sorry to say your new colleague is a liar. He never was professor here, and in the memory of the oldest settler not even a student. (Of course he could be a professor without being a student.) Tar and feather him, or put any other white man's burden on him and you will not hurt our feelings. The method he uses, or claims to, is very popular in this State, because they inject live bull's serum, but why not have ass's, or even rabbit's, I cannot tell.

Yours, et cetera,

DOCTOR X.

MINOR INTELLIGENCE.

DOCTOR ROBERT B. BEAN, instructor in anatomy at the University of Michigan, recently resigned to accept a position in a medical school in Manila, Philippine Islands.

DOCTOR I. BOAS, of Berlin, the well-known author of text-books on diseases of the stomach and intestines, has been elevated to the professorship of stomach diseases at the University of Berlin.

DOCTOR HELEN E. BROOKS, director of physical training in the Barbour Gymnasium at the University of Michigan, presented her resignation at a recent meeting of the Board of Regents.

DOCTOR MARKHAM S. KERRITT, of Clifton, Bristol, England, vice-president of the British Medical Association, died recently in that city. He was one of the foremost physicians of the British Empire.

HAVANA is to have a tuberculosis sanitarium affording accommodation for sixty patients. The institution will be situated twelve miles from Havana. Havana has likewise a League Against Tuberculosis.

THE legislature of Minnesota has appropriated $5,000 yearly for the maintenance of a Pasteur Institute, which will be located at Minneapolis. It will be under the direction of the State Board of Health.

PLAGUE recently made its appearance in San Francisco, but owing to vigilance of the authorities spread of the disease was prevented. The victim was a sailor who died three days after admission to the Marine Hospital.

MRS. ROSA HARRISON died recently in Trenton, New Jersey, at the reputed age of one hundred four years. She was a Russian, and claimed to remember vividly the scenes of Napoleon's invasion of Russian territory.

THE Second International Congress of School Hygiene is to meet in London during August, 1907, under the presidency of Sir T. Lauder Brunton. "Medical Inspection of Schools" will be the subject of special discussion.

DOCTOR WILLIAM B. FLETCHER, of Indianapolis, died at Orlando, Florida, April 25, 1907, age seventy-one years. He was one of the best known physicians in the Middle West, and an earnest worker on nervous and mental diseases.

PROFESSOR MAX SCHÜLLER, whose researches to determine the causative organism of cancer created wide attention, died recently in Berlin at the age of sixty-seven. Doctor Schüller was a member of the medical faculty of the University of Berlin.

DOCTOR HUGO A. FREUND, first assistant in internal medicine in the University of Michigan for the past two years, has recently located in Detroit and opened offices in the Washington Arcade. A paper from his pen—"Situs Viscerum Transversus"—will shortly appear in this journal.

THE Medical Society of Mercer County, New Jersey, has adopted a resolution to the effect that a record shall be kept by the secretary of persons who avoid paying for professional services. Every member of the society is pledged to aid the secretary in his work.

THE Michigan State Board of Health recently elected the following officers: President, Doctor Angus McLean, of Detroit; vicepresident, Doctor Malcolm C. Sinclair, of Grand Rapids; secretary, Doctor Frank W. Shumway, whose official term continues by virtue of gubernatorial appointment.

ROBERT BARNES, M. D., F. R. C. P., F. R. C. S., one of England's most prominent obstetricians, recently died at his home in Eastbourne, at the advanced age of ninety years. He was instrumental in founding the Obstetrical Society of London, 1858, and the British Gynecological Society, 1884.

TENNESSEE has lately enacted a new dental law which is calculated to elevate the standard of the profession in that state. Heretofore any person could apply for examination for practice rights regardless of qualification, but under the new law only graduates of approved colleges are eligible.

SIR WILLIAM HENRY BROADBENT, Physician in Ordinary to King Edward VII, died on July 10, aged seventy-two years. Besides administering to the physical welfare of the King he was likewise physician to the Prince of Wales and consulting physician to St. Mary's Hospital, Paddington, and to several London hospitals.

GOVERNOR HUGHES, of New York, has signed the bill lately passed by the legislature creating a single examining board in medicine. What effect this will have on osteopaths and other cults remains to be seen. However, the fact is patent that it will tend to render uniform the requirements for medical practice and place the licensing of physicians upon a uniform basis.

PLAGUE continues to reap an uninterrupted harvest in India, an enormous number of deaths occurring in certain regions. During the first week in April, 87,161 cases were reported, with 75,472 deaths, an increase of 12,000 deaths over the preceding week.

THE hospital of the University of Pennsylvania is to be enlarged and rendered typical of the prevailing style of architecture at the University, which is Elizabethan. Plans have already been drawn for the improvements which contemplate more especially an overhauling of the medical wards.

BERLIN will be the meeting place of the Fourteenth International Congress of Hygiene and Dermatology, the time being September 23 to 29, 1907. The sessions will be held in the forenoon in order to give the visitors an opportunity to inspect the hygienic institutions of the city, of which there are over one hundred.

TWENTY thousand dollars has been left to Saint Luke's Hospital, New York City, by James Morris, for the purpose of providing park rides for the children of the institution. Besides this sum, $6,000, which Mr. and Mrs. Morris left in memory of their son, will be spent to provide music and a singer for the wards.

THE recent fire sustained by the Kress & Owen Company practically destroyed the manufacturing department of that enterprising concern, but a duplicate stock in storage rendered possible the filling of current orders for glycomthymoline, and after four days and nights of continuous work the product was again being manufactured in supply to meet the demand.

FRIEBURG, Germany, has a dental clinic in connection with the public schools of the city. The clinic is in charge of a dental surgeon whose duty is to examine all children of school age both in their homes and in the schools. A report of examinations is sent to parents, who are urged to have the children take advantage of the free treatment accorded.

JERSEY CITY has provided a station for the free distribution of pasteurized milk to poor women who desire the article for infant feeding. Likewise *anyone* may secure the product by paying the cost of bottles. Heretofore free dispensaries have been maintained in the drug stores, but these are now abolished and the appropriation will be utilized to support the central depot.

DOCTOR FREDERICK G. NOVY, of the University of Michigan, recently lectured before the Detroit Academy of Medicine, the Buffalo Academy of Medicine, and the Joint Meeting of the Pathological and Medical Societies of Chicago. While in the latter city the doctor likewise addressed the American students at Chicago and Northwestern Universities, as well as the students of the Chicago Veterinary College.

OSTEOPATHY has received a signal blow in Texas by the passage of the new medical law, which abolishes the various medical examining boards, and provides for the establishment of a single examining body. Henceforth only men who have spent four full years in college and who are graduates are eligible for examination.

ACCORDING to report the first woman practitioner of medicine was Christina Erxleben, who graduated at Halle in 1754. Marie Pittracina, who resided in Florence, graduated in 1780. Zaffira Peretti was granted a degree at Bologna in 1800. Elizabeth Blackwell, the first woman physician in America, received her diploma in New York in 1850.

CHRISTIAN SCIENCE received another setback in New York lately by the conviction of a member of the cult for failing to provide medical attendance for his child who was ill with bronchopneumonia and who died as a result of the disease. In New York state this is a misdemeanor, punishable by a year's imprisonment or a fine of five hundred dollars.

QUIET zones have been established by the Board of Aldermen of New York City, certain districts, especially those in which hospitals are located, being contemplated by the innovation. Under the provisions of the ordinance teamsters and motormen are compelled to drive slowly and as quietly as possible through these zones, and children and peddlers are prohibited from yelling.

THE *American Medical Compend* recently issued a number devoted exclusively to the work of Doctor Byron Robinson, whose original researches in the field of abdominal and genitourinary surgery and anatomy have rendered his name known throughout the medical world. Doctor Robinson is a frequent contributor to this journal and an illustrated article from his pen will appear in an early issue.

THREE hundred thousand dollars has been subscribed by Mrs. Russell Sage to found a Russell Sage Institute of Pathology in New York City. The institute will be under the direction of Doctors Edward G. and Theodore C. Janeway, with whom will be associated the Commissioner of Public Charities of the City of New York, Doctor D. Bryson Delevan, Doctor Simon Flexner, of Rockefeller Institute, and Professor Graham Lusk.

ABSINTHE, which has played havoc with the French people, physically and mentally, will continue to enjoy favor in France. A bill recently introduced to absolutely prohibit its sale has been rejected by the Commission of Hygiene of the Chamber of Deputies. The measure was repudiated on the ground that discrimination could not be made between absinthe and other liquors, but the commission recommended the passage of a law to prohibit the manufacture of cheap imitations of the product.

Chicago is to have a new People's Hospital, at the corner of Twenty-second street and Archer avenue. The building proper is to be three stories in height and constructed of steel and pressed brick. The project is being financed by the People's Hospital Association, of which Doctor William D. Schaefer is president.

The new Bellevue Hospital, which is being erected in New York City, will cost $8,500,000. It will cover not only the site of the old buildings, but will extend another block to the north, stretching from Twentysixth to Twentyninth Street and from First Avenue to the East River. Accommodations will be afforded for two thousand patients at once. An absolutely fire-proof structure has been planned. The masonary wall will be self-supporting and the columns and floor beams will be of steel. Hollow terra cotta blocks, an unburnable material, will be employed in constructing floors and walls and as covering for columns. Fire will be unable to spread beyond the room in which it originates.

RECENT LITERATURE.

REVIEWS.

OPERATIVE GYNECOLOGY.*

It is over nine years since the first edition of this great work appeared. Its publication marked an era in medical book-making. Not only was the text original, instructive and interesting, but the illustrations were so accurate and artistic as to delight those who had tired of the miserably-drawn and poorly-reproduced wood cuts of other volumes. It was not a work you removed from its wrappings as delivered by the expressman, carefully placed upon the library shelf and rarely ever consulted again. It was a work one was fond of reading as well as consulting. It was not a mere picture book as some of the envious critics claimed. There was plenty of meat in it, only it was served in an attractive form. It was but natural it should have had man imitators, but in its own field it never had an equal. In fact the combination of Howard Kelly and Max Brödel is a hard one to beat, especially as they are not content to rest upon their laurels, but are mighty workers. Hence it is not surprising that this second edition is far superior to the first and shows the result of careful revision. In fact it can hardly be called a revision, as it has been so largely rewritten, condensed and elaborated as to entitle it to be called a new work.

It is to be noticed that permanganate of potash and oxalic acid are still employed in the Hopkins clinic for the sterilization of the hands and forearms and the author claims that an extended practical experience justifies his confidence in these agents. While this may be true, it also cannot be denied that in other clinics, equally good results obtain where simple methods are employed. In the present edition rubber gloves and face masks are advocated and the statement is made that rubber gloves were used in the clinic in the early nineties before their advocacy by Manteuffel in Dorpat. Still one cannot help feeling that they could not have been habitually employed, else some mention of the fact would have appeared in the first edition.

Evidently for the benefit of the general practitioner Chapters VII, VIII and IX have been added. These deal respectively with Local and Palliative Treatments, Menstruation and its Abnormalities, and Uterine Displacements and their Treatment by means of Packs and Pessaries. While these subjects have been treated judiciously and fairly, one cannot but feel that they were written at the demand of the publishers or medical public and not from any special desire on the part of the author to set forth his views. With a view of instructing the practitioner, a few cuts showing how to adjust and introduce a pessary would have been of service.

The chapter on Bacteriology has been entirely rewritten and brought up to date by Doctor W. W. Ford.

The chapter on anesthesia has been entirely rewritten by Doctor Cook. It is filled with many valuable suggestions and will repay the most careful reading. The value of recording the blood pressure during anesthesia as a means of determining the cardiovascular condition of the patient is set forth at some length. From the description and illustration it would seem as if such a method would not be very practical outside of a clinic where a number of assistants were available.

In the chapter on diseases of the External Genitals the important subject of affections of the vulvovaginal glands has been remodeled upon the recent work of Doctor T. S. Cullen. Several good illustrations on the anatomy of Bartholin's glands add to the value of the chapter.

The new chapter on Diseases of the Hymen is by Gellhorn. It has been well done, although a few more illustrations would have added to the value of the text, especially in the consideration of retained menstrual fluid.

The chapter on Rupture of the Rectovaginal Septum and relaxed vaginal outlet has been brought up to date by the description of vaginal flaps and direct suture of the sphincter ani muscles in complete tears of the perineum. These methods so completely answer every purpose as to seemingly make unnecessary the detailed description and illustration of the older technique.

The chapters dealing with Affections of the Urethra, Bladder and Ureters have been rewritten and greatly added to. They reveal the work and observations of one who has ever stood foremost in this line of work in America.

The new chapter on the Use of the *X*-ray in Detecting Calculi by

Doctor Baetjer is concise and extremely useful. The subject is still in its infancy and not generally understood by the profession. Hence any authoritative communication along this line is timely. .

The chapter on Inversion of the Uterus by Doctor Dobbin is rather disappointing. Too much space is given to methods which, in the large majority of cases, will not prove serviceable, while the description and illustration of such a method as anterior colpohysterotomy (Spinelli's operation) has been entirely omitted. It should have been stated that the abdominal operation for the reduction of an infected inverted uterus is never justifiable.

The second volume has also been greatly enlarged and improved, many chapters having been entirely rewritten. While the space at our disposal prevents a detailed review of this volume, it is impossible not to mention the splendid chapter on the radical abdominal operation for cancer of the cervix by Doctor Sampson. This investigator has done the most extensive and, taken as a whole, probably the best work in America along these lines, hence it is not surprising that the chapter is a masterpiece. It will repay careful study on the part of both the general practitioner and specialist.

In conclusion, let us again express our admiration for the work under consideration. It should be in the library of every progressive general practitioner and it is simply indispensable to the specialist.

R. P.

*By Howard A. Kelly, A. B., M. D., LL. D., F. R. C. S. (Honorary, Edinburgh), Professor of Gynecologic Surgery in the Johns Hopkins University and Gynecologist to the Johns Hopkins Hospital, Baltimore, et cetera. With 11 plates and 703 original illustrations for the most part by Max Brödel. Second edition, revised and enlarged; two volumes. D. Appleton & Company, New York and London, 1906.

A MANUAL OF MEDICINE.*

One of the most popular modern manuals of medicine—Monro's—has recently appeared in its second edition. This treatise has held a high place among medical text-books in England, and its publication in the United States affords a valuable acquisition to our list on practice.

Beginning with a general consideration of fever and infectious diseases the author launches at once into the acute exanthemata. An interesting feature, and a useful one to the student, is the insertion of the more common as well as the older names of all the diseases. The etiology is well treated in most cases, the symptoms are concisely given, and together with the diagnosis afford the reader a clear picture in every instance. The complications and sequellæ are not as carefully considered. A little fuller discussion in almost every instance would add greatly to the value of the work. The essentials in treatment are admirably given and are a valuable guide to the student of today who is attempting to follow rational therapeutics.

In the second section the constitutional diseases are discussed. It is gratifying to see osteoarthritis replacing arthritis deformans, rheumatoid gout, *et al.* Though the classification is not all that could be desired, it fulfills many requirements of the recent work on arthritides.

The introduction to the chapter on diseases of the circulatory system is highly commendable. With the growing need for more careful and analytic sphygmographic work, the short consideration of pulse tracings in various cardiac lesions is a valuable one.

A large portion of the book is devoted to the diseases of the nervous system. The illustrations of this section are valuable and add greatly to the explanation of many of the cerebral diseases that often baffle the student.

It is unusual in American text-books to find a section on diseases of the skin. In fact, this branch has become so separate and distinct a part of practice that it is seldom associated. That it bears a close relation to general medicine, however, no one will dispute, hence a chapter of this nature is not unwelcome in a manual of medicine.

The book should have an extensive sale inasmuch as it niche between the voluminous text-book and the meagre compend.

*By T. K. Monro, M. D., Professor of Medicine in Saint Mungo's College, et cetera. Second edition. Published by William Wood & Company, New York. Cloth, $5.00.

ATLAS AND TEXT-BOOK OF HUMAN ANATOMY.*

The second volume of the American edition of the "Sobotta Atlas" treats of the viscera, including the heart. The reproductions of the illustrations seem, on the whole, very successful. We can but repeat our opinion as to the great value to the student and practitioner of such practical and excellent anatomical illustrations, and of such a clear and concise text.

*Volume II. By Professor J. Sobatta, of Wurzburg. Edited, with additions, by J. Plaiyfair McMurrich, A. M., Ph. D., Professor of Anatomy at the University of Michigan, Ann Arbor. Quarto volume of 194 pages, containing 214 illustrations, mostly all in colors. Philadelphia and London: W. B. Saunders Company, 1906. Cloth, $6.00 net; Half Morocco, $7.00 net. W. B. Saunders Company, Philadelphia and London.

GREEN'S PATHOLOGY.*

The well-known "Green's Pathology" has now reached its tenth edition, and in so doing shows the popular demand for such a concise manual. An examination of the present volume does not, however, bear out the claims of editor and publisher as the up-to-date revision of the work. Many pages show the pathology of the last decade rather than of the present time, and a number of errors do not speak well for the editor's work. The well-known weakness of the English School of pathology makes the book inferior to the German text-books of pathology, but this very weakness, as shown in the superficial, poorly-digested but dogmatic treatment, becomes unfortunately a bid for popular favor in this country.

*A Text-Book of Pathology and Pathological Anatomy. By T. Henry Green, M. D., F. R. C. P., Consulting Physician to Charing Cross Hospital, London. New (tenth) edition. Thoroughly revised by W. Cecil Bosanquet, A. M., M. D., F. R. C. P., Assistant Physician to Charing Cross Hospital. Octavo, 606 pages, 348 engravings and a colored plate. Cloth, $2.75 net. Lea Brothers & Company, Publishers, Philadelphia and New York, 1905.

TUBERCULOSIS AS A DISEASE OF THE MASSES AND HOW TO COMBAT IT.*

THE little work of Doctor Knopf is so well known that it is only necessary to call attention to the present revision. The first good work on the subject of tuberculosis as a disease of the masses, it still remains one of the best on account of the fulness and, at the same time, the conciseness and accuracy of its statements. It should be in the hands not only of all doctors, but also of teachers, members of boards of health and philanthropists of all kinds. The supplement contains an account of some of Doctor Knopf's useful additions to the management of tuberculosis and practically brings the volume up to date. G. D.

*Prize Essay by S. A. Knopf, M. D., New York. Fourth issue, revised and illustrated. Published by Fred P. Flori, 514 East Eighty-second street, New York. Also for sale by "Charities and the Commons," 105 East Twenty-second street, New York City, 1907.

TEXT-BOOK OF COMPARATIVE GENERAL PATHOLOGY.*

THERE is a great need for a proper reference book of "Comparative General Pathology." Kitt's work, while perhaps the best one extant, is, nevertheless very incomplete and in many ways unsatisfactory. It has gained nothing at the editor's hands. A desirable book in this line yet remains to be written.

*By Professor Doctor Th. Kitt, Munich. Authorized Translation by Doctor W. W. Cadbury, Assistant Demonstrator of Pathology, University of Pennsylvania. Edited with notes and Original Illustrations by Doctor Allen J. Smith, Professor of Pathology in the University of Pennsylvania. Illustrated with 131 text illustrations and four colored plates. Large 8vo; cloth, $5.25 net. W. T. Keener & Company, Chicago.

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ORIGINAL ARTICLES.

MEMOIRS.

THE MEDICAL TREATMENT OF HEMORRHAGE.*

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IF an excuse be needed for taking up a few minutes of your time in a brief consideration of the medical treatment of hemorrhage, it will be found in the conflicting opinions and diversity of practice at present indulged in by the members of our profession.

Any intelligent consideration of this question must be preceded by a brief review of some of the physiology of the circulation of the blood, its coagulability; and the action of certain drugs upon circulation and coagulation.

We all know that within the animal economy is situated an automatic compensatory circulatory mechanism, the chief function of which seems to be to supply and maintain a sufficient circulation of blood in each and every organ and tissue of the body; that the supply to each organ must be capable of very wide variation; that it consists of a central organ, the heart acting as a pump; this organ consisting automatically of a single, but physiologically of two hearts beating synchronously; of arteries, veins and capillaries; that these organs are supplied with valves which keep the blood flowing in an onward direction only; that the heart acting as a pump, together with peripheral resistence, maintains a higher blood pressure in the arteries than in the veins, that this difference in pressure between the arterial system on the one hand and the venous system on the other, is the cause of the circulation; that peripheral resistance is made up of three factors, that in the capillaries, and that in the arterioles, and the varying degrees of viscosity of the blood.

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*Read at the Elkhart meeting of the NORTHERN TRI-STATE (Michigan, Ohio, and Indiana) MEDICAL ASSOCIATION.

There are two circulatory systems, the systemic and the pulmonary. The systolic blood pressure in the systemic circulation amounts to about one hundred thirty-five millimeters of mercury, while the pressure in the pulmonary circulation is about one-third of this, and some authors state that it is only one-eighth. The diastolic blood pressure is fifty or sixty millimeters of mercury, less than the systolic, this range between systolic and diastolic being spoken of as the pulse pressure.

The activities of the heart vary widely from moment to moment. The chief factor in peripheral resistance is undoubtedly the action of the vasomotor nerves acting upon the muscular fibres of the arterioles, and this influence is subject to sudden variations, and yet, by a marvelous coordination of activities, cardiac and vasomotor, a comparative mean blood pressure, and circulatory harmony is established and maintained. The relationship of arterial pressure in the systemic circulation to venous pressure is expressed in the law which says, "all those conditions which tend to diminish the difference in pressure between the arterial system on the one hand and the venous on the other, increase venous pressure." In other words, a high arterial pressure means a low venous pressure; a low arterial pressure means a high venous pressure. It is generally agreed that the systemic arterioles are richly endowed with vasomotor nerves and we are comparatively familiar with the drugs which influence them.

Unfortunately, the physiology and histology of the pulmonary circulation, and the relationship of the latter to the systemic circulation are not matters in which there is a concensus of skilled opinion. For example, what effect does a rise or fall of blood pressure in the systemic circulation have upon the blood pressure in the lungs? Concerning this very important question, upon which rests the scientific treatment of hemoptysis, Francis Hare, of London, says (*Journal of the American Medical Association*, May 4, 1905, page 725): "The experiments of T. C. Brodie and W. E. Dixon, seem to show that the pulmonary arterioles are destitute of vasomotor nerves and that, consequently, agents which promote constriction of the systemic arterioles tend to cause pulmonary engorgement." "Hence it is that agents which promote dilatation of the systemic arterioles will tend to cause pulmonary ischemia."

Concerning the above question, the effect of a rise of blood pressure in the systemic circulation upon the blood pressure in the pulmonary circulation, Professor Joseph Erlanger, of Madison, Wisconsin, in a recent personal communication says: "Before this question can be intelligibly answered, a brief review of the relation of the pressures in the two circulations is called for." "This review is based upon the latest good work known to me upon this subject (Tigerstedt: "Uber den Lungenkreislauf," *Skand. Arch. f. Physiol.* VIV, 259, 1903).

"Tigerstedt finds that there is no relationship between the pressure variations in the pulmonary region and in the carotid; that the pressure variations in the right heart (and therefore in the pulmonary artery) are quite small, usually not exceeding ten millimeters of mercury." "This result, he believes, is due to the fact that the resistance offered by the pulmonary capillaries to the flow of blood through them is very slight." "Thus he finds it possible to tie off an entire lung without materially affecting the blood pressure in the pulmonary artery." "Furthermore, it is necessary to know the pulse pressure in the pulmonary artery and its relation to the pulse pressure in the systemic circulation." "Unfortunately, I have no figures at hand, illustrative of this point." "Since, however, the systolic pressure in the right ventricle is not high, twenty-five millimeters of mercury (Tregerstedt), and since the walls of the right ventricle are relatively weak, it may be assumed that pulmonary pressure is not large and that its variations are correspondingly small."

"Answering the question in the light of these remarks, it seems reasonable to maintain that variations in the systemic systolic blood pressure produced by variations in the mean pressure, would not affect the pulmonic pressure;" "that variations in the systemic systolic pressure resulting from variations in the force of the heart beat, would be associated with similar, but very much slighter, variations in the pulmonic systolic pressure, since presumably the force of contraction of the right ventricle varies *pari passu* with that of the left ventricle."

In a recent paper (*London Lancet,* November 24, 1906) Hare reiterates his former opinion above quoted, and quotes the work of Pic and Pettijean, who claim to have demonstrated the action of amyl nitrite experimentally, and that in curarized animals whose lungs are exposed, they became blanched after the administration of amyl nitrite, but that at the same time *the blood pressure in the pulmonary artery rises,* and they make the very extraordinary claim, which to my mind is absurd, that the amyl nitrite causes *dilatation* of the *systemic arterioles* and *constriction* of the *pulmonary arterioles,* by acting on the vasodilators in the former and the constrictors in the latter instance.

I have referred to the fact that Brodie and Dixon have apparently established, that the pulmonary circulation is almost destitute of vasomotor nerves. It is only fair to state that Plumier, using the same technique, obtained opposite results. Bradford and Dean and Francois-Franck, reach the positive conclusion that the vessels of the lung do possess vasomotor fibres. In the light of these conflicting results, Professor W. H. Howell, physiologist of Johns Hopkins University, sums up the question ("Howell's Physiology," page 551, 1905) with this statement: "The existence of the vasomotors of the lungs has not been demonstrated."

Before passing to the treatment of hemoptysis, it may be well to recall what has been stated already, that a sudden lowering of the arterial pressure raises the venous pressure, that the veins of the splanchnic area are capacious and capable of holding possibly all the blood of the body; and that a rabbit whose sympathetic is paralyzed, will die if suspended by the ears as it "bleeds into its own belly."

The viscosity of the blood, according to Doctor John H. Watson, is about five times that of distilled water, and he says that it may sometimes in disease be ten times that of water. This increased viscosity of the blood favors its coagulation and increases peripheral resistance, thus tending to cause a rise in blood pressure and increased work for the heart. Lessening the viscosity tends to lower the blood pressure and to diminish the work of the heart.

The following scheme shows the agencies which affect the peripheral circulation.

- *Blood pressure. Peripheral factors.*
  - *Raised by*
    - *Vasoconstrictors*
      - Adrenalin.
      - Digitalis.
      - Cold to the skin.
      - Ergot.
      - Strychnia?
    - *Increased plasticity of the blood*
      - Calcium.
      - Gelatin.
      - Alcohol.
      - Chloroform.
      - Adrenalin.
      - Nitrogenous foods.
  - *Lowered by*
    - *Vasodilators*
      - Morphin.
      - Amyl nitrite.
      - Nitroglycerin.
      - Diuretics.
      - Chloral hydrate.
      - Nitrites.
      - Heat to skin.
      - Aconite.
      - Alcohol.
      - Cathartics.
    - *Diminish plasticity of the blood*
      - Iodides.
      - Citric acid.
      - Fruits.
      - Salts of
        - Potassium.
        - Ammonium.
        - Sodium.
      - Thyroid extract.

The viscosity of the blood is increased by: excess of CO_2 in the blood; alcohol (Burton-Opitz); nitrogenous foods (Burton-Opitz quoted by Watson); salts of calcium, strontium, magnesium (A. E. Wright); by anything which increases the blood corpuscles; by hydrastis; by cold water baths; the hot air bath; adrenalin; gelatin; alcohol, and chloroform.

The viscosity is lessened by: a febrile temperature (Graham Brown, John H. Watson, Deming); citric acid and salts of potassium; sodium and ammonium (A. E. Wright); thyroid extract; iodides; and the hot water bath. The hot water bath also raises the pulse pressure, that is, the difference between the systolic and diostolic pressure.

Blood pressure in the systemic circulation may be raised by stimulating the vasoconstrictors, and by those substances which increase the viscosity of the blood.

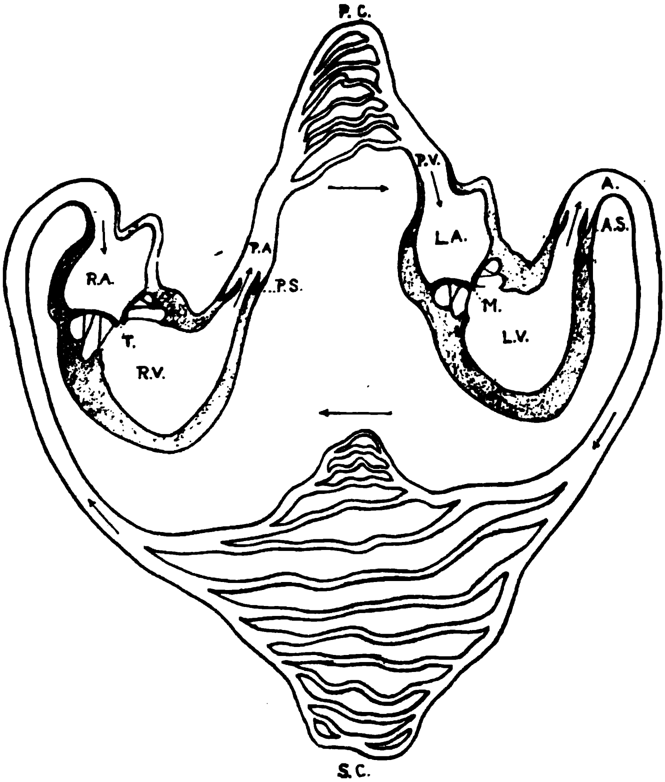
It may be lowered by acting upon the vasodilators and by diminishing the viscosity of the blood.

The vasomotor mechanism is doubtless the more important of the two, although Watson, Deming, and even Sir W. H. Broadbent maintain that the chief element in peripheral resistance resides in the capillaries. Their position would seem to be rendered untenable by the experiment already referred to in which a rabbit with paralyzed sympathetics will die if suspended by the ears.

HEMOPTYSIS.

Bleeding from the lungs occurs chiefly in two diseases, mitral obstruction and pulmonary tuberculosis, the latter disease furnishing eighty-four per cent of all cases. Let us first consider the treatment of the former condition. Notwithstanding the opinions and theories of physiologists, some of which I have already quoted, I think clinicians are agreed that in certain diseases, especially the one under consideration and also in mitral regurgitation, the pulmonary blood pressure does rise and to such height as to cause pulmonary hemorrhage, due to engorgement in the pulmonary circulation, and that at this time the blood pressure in the *Systemic circulation is abnormally low.* A glance at the following diagram shows how this is brought about. The diagram shows the two sides of the heart separated to show the work of each. Either obstruction, or regurgitation at (M.) results in undue pressure in the left auricle (L. A.), a rise in the pressure in the pulmonary circulation, this pressure continuing so long as the right ventricle (R. V.) remains normally active and there is no dilatation of the right auriculoventricular orifice with consequent safety-valve action of the tricuspid valve. Because of the fact that the left ventricle (L. V.) receives less than the normal amount of blood with each auricular systole, the blood pressure in the systemic circulation falls, venous pressure rises in accordance with the law already quoted, the right heart becomes overfilled and the pressure in the pulmonary circulation rises to the danger point. This also explains the fact that in obstruction or leakage at the mitral valve in the left side of the heart, the hypertrophy occurs, primarily, not in the left, but in the right ventricle. It must be apparent that the rational treatment consists in an attempt to get the blood out of the venous into the arterial side of the circulation, where it belongs. The best remedies for this condition are absolute rest, mental and physical, morphin and digitalis.

What are the conditions in hemorrhage from pulmonary tuberculosis? The viscosity of the blood is below normal, the heart is increased in frequency, its efficiency impaired, the blood pressure low. The indications are, absolute rest in order to lessen the frequency and violence of the respiratory movements, increase the viscosity of the blood, and, if possible, lower the blood pressure in the pulmonary circulation.



The first two of these indications can be effectually met by keeping the patient in bed, lying on the affected side, the administration of morphin, one-quarter grain, hypodermically, the giving of ten drops of chloroform in water, and, later the viscosity of the blood may be increased by the administration of calcium and hydrastis, and a meat diet. If these means do not avail, then recourse may be had to the hyperdermic injection of three ounces of a two per cent solution of fractionally sterilized gelatin, or, the use of normal salt solution given in the same way. I do not know how chloroform acts, except that it is a styptic and increases the viscosity of the blood, but I have had excellent results with it. In regard to the administration of other drugs there is the greatest diversity of opinion. Thus Hare, of London, employs amyl nitrite, basing its use on the theory already described, that it causes dilatation of the systemic blood-vessels and constriction of the pulmonary circulation. I have already shown why I cannot subscribe to this theory. I can see, however, that a sudden lowering of the systemic circulation might, by diverting a large amount of blood into the splanchnic area diminish the amount of blood flowing through the lungs in a given time. If, however, in a given case there is clinical evidence of pulmonary venous engorgement due to cardiac inefficiency, I believe amyl nitrite and nitroglycerin are distinctly contraindicated and that digitalis and strychnia are called for. Ergot and adrenalin chlorid contract the systemic arterioles. Ordinary styptics, tannin and the like, are worse than useless. In the intervals between the attacks, I employ syrup of Dover's powder instead of morphin.

The examination of the chest should be interdicted entirely, but if done at all, at the time of the hemorrhage, should be limited to auscultation, and this should be done in such manner as not to disturb the patient. The semisitting posture should be assumed by the patient as the horizontal lowers arterial pressure and leads to pulmonary engorgement. Thus these patients cough more and are breathless on going to bed, and patients with pulmonary engorgement due to cardiac inadequacy cannot lie down. Strapping of the affected side may be resorted to after the first hemorrhage ceases, but the patient should not be disturbed enough to apply it while any bleeding is going on. Until the physiology of the circulation is written, much of the therapy of hemoptisis must remain empirical.

CEREBRAL APOPLEXY.

The conditions are usually a very high blood pressure together with degenerated vessels, and often an intestitial nephritis. In all cases, the pressure is higher than the retaining power of the vessel walls. The immediate indication is to lower blood pressure so as to prevent further escape of blood. This is best accomplished by the administration of nitroglycerin and amyl nitrite, pushed to the physiologic limit, always bearing in mind the evanescent character of their effects, lasting only about ten minutes. As soon as the pressure is brought down by these quickly acting drugs, and the hemorrhage has ceased, the lowered pressure may be maintained by the giving of strong purgatives like croton oil, the administration of those substances which diminish the viscosity of the blood, such as the iodides, citric acid, the warm bath, aconite, thyroid extract, and chloral hydrate. Chloral is especially valuable as it lowers blood pressure, relaxes vascular spasm and causes sleep. For the same reason the diet should contain a minimum of the nitrogenous foods and should contain very little chlorid of sodium. The following are absolutely contraindicated: calcium, ergot, adrenalin chlorid, digitalis, hydrastis, cold baths, iron, gallic acid. It goes without saying that a differential diagnosis should be made between apoplexy, embolism, thrombosis, and cerebral edema of nephritis.

TYPHOID FEVER.

In this disease there is ulceration with consequent hemorrhage. In all probability there is also vasomotor paralysis, allowing the stress of the ventricular contraction to fall upon the capillaries with added tendency to rupture of the delicate capillary wall.

The indications are, to secure absolute physical and mental rest, to arrest intestinal peristalsis, to limit the amount of mechanical irritation at the bleeding point, and to increase the viscosity of the blood. For the purpose of securing physical and mental and intestinal rest, the drug of drugs is morphin. It should be given in doses of at least one-fourth grain. Adrenalin chlorid is valuable as it contracts arterioles, acting on all vessels supplied by the sympathetic, arrests intestinal peristalsis, and stimulates the heart, probably by acting upon the heart muscle, and it is said to increase the plasticity of the blood. It should be given hypodermically, well diluted, as it is said to not be absorbed by the stomach.

The most trustworthy agent in increasing the plasticity of the blood is the chlorid of calcium. I have had very satisfactory results and believe I have saved lives by the use of gelatin as already described. It may also be used by the mouth and by enema. The ice-bag is warmly recommended by some. Raising the foot of the bed I consider of questionable value. Absolute physical rest should be enjoined and the abdomen should not be examined. Milk should be stopped. The food should contain plenty of salt. Ergot should not be given as it increases intestinal peristalsis. Iron and other astringents by the mouth are of very questionable value.

HEMATEMESIS.

Indications: Rest, local styptics, morphin, adrenalin chlorid, hypodermically and by mouth, gelatin, ice by mouth and locally, hydrastis, chloroform water. During attack, this is a medical and not a surgical affection—cirrhosis.

HEMOPHILIA.

I have obtained the best results in this disease from the long continued administration of calcium chlorid. In one case I continued its administration over a period of nearly three years. During this time the hemorrhages which had previously been frequent and severe, especially from the kidneys, ceased entirely, robust health replaced a condition of chronic invalidism, the arthritic phenomena were vastly improved and the patient was apparently cured. I lost track of him after three years.

EPISTAXIS.

Here the principles above set forth should govern. I refer to it here only to call attention to a commonly overlooked point in diagnosis. When a patient of over thirty has recurring attacks of nosebleed without apparent cause, always examine the blood pressure and the urine and you will find the cause in the majority of cases. The nosebleed in these cases does not call for treatment, but the condition on which it depends does call for prompt interference. The hemorrhage should be regarded simply as a danger signal warning of that which is very much more serious than itself.

Chicago, 70 State Street.

SOME ORGANIC CHANGES IN SLEEP.*

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THIS paper is a very brief discussion of some of the changes in respiration and in the circulation in the brain and the peripheral parts of a sleeping subject. It concerns only the volume reactions and a reference to results on blood pressure in normal sleep and while the subject is lying down upon his back or propped up at an angle of 45° to 55°. It makes no attempt to study the records taken under other conditions nor the results in rate, form, and other characters of pulse and respiration.

The subject from whom many of these curves have been taken is the same man who served for the work on waking reactions reported in a recent number of the *American Journal of Psychology*, and the method of taking the curves was similar.

The subject was in a dark room. The necessary tubes and wires were passed through the wall to the recording apparatus, which was placed in another room. A third person nearly always assisted in giving the stimuli and finding out the condition of the subject. In taking many of the records, he was seated near the subject, and used a light that could be darkened to the degree desired, either by a sliding shade, or better, by increasing the resistance in the electric circuit and so reducing the intensity.

One of the most troublesome factors in all such work, and one that has played a much greater part in the published records than most writers acknowledge, is movement,—the irregular movements when the subject changes his position in sleep or when he awakens, and the movements of breathing. In the greater part of these records it was

*Read before the CLINICAL SOCIETY OF THE UNIVERSITY OF MICHIGAN, March 13, 1907.

reduced to a negligible quantity by placing the subject's head in a swing.

A second subject has beeen acting during the past school year. He has a trephine on the right side of the forehead. The method of work with him is similar to that with the first subject. Movement is practically eliminated, as a rule, without the use of a swing. In addition a hard rubber capsule has been made to fit the shape of the head and cover the trephine air-tight. This has been used a great deal during the present year. Following is a summary of results:

The volume of the brain and of peripheral parts (hand and foot) increases when the individual goes to sleep, and decreases when he awakes. There is often a temporary fall of the brain volume preceding the more marked rise which shows itself as sleep becomes deeper. There is a prominent breathing wave in the plethysmographic records from both brain and periphery. The phasic relation is such that the fall in the circulation record very nearly corresponds to an inspiration, the rise to an expiration. If there is any difference, the fall in the brain volume shows itself a fraction of a pulse beat before the respiration curve begins its descent. Stimuli that disturb but do not awaken the subject cause a temporary increase in breathing in both chest and abdomen, a fall of volume of the brain and peripheral parts with comparative elimination of the breathing wave therein. When the subject is sleeping soundly and there are apparently no distinct stimuli acting, one often finds a more or less rhythmic repitition of such changes, analogous to the Traube-Hering wave. There is always some evidence of this wave, and the changes in brain and periphery are always parallel, or very nearly so. The wave is often much more marked in one than in the other. The general blood pressure is lower during sleep while the brain volume is highest, and rises when the brain volume falls with awakening.

It looks as though we could not agree that control of the brain circulation is a matter entirely of control of general blood pressure, that the supply of blood to the brain increases or decreases passively with rise or fall of pressure. Increase in volume of the brain, increase in size of arterial pulse from the brain and low blood pressure could not well occur together. There is, apparently, constriction and expansion of the cerebral vessels themselves. The exact laws of these reactions and the causes of the Traube-Hering and breathing waves cannot be discussed here. But some changes in the other characters of the pulse indicate the same thing.

Sleep is probably not due to anemia of the brain, and perhaps pressure has nothing directly to do with the matter. It may be that any considerable change in the size of the small vessels in the brain disturbs the connections of the axons and dendrites sufficiently to bring on sleep when the neurons have already relatively lowered excitability and the subject is withdrawn from too strong stimuli.

Ann Arbor, Psychological Laboratory.

REMARKS ON THE SURGERY OF THE WAR OF 1812.*

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THE War of 1812 began in the spring of that year and continued until 1815. We will not review the whole campaign in this paper but speak briefly of that part of the war which was under the direction of William Henry Harrison and Oliver Hazard Perry, because it concerns particularly Detroit and the western end of Lake Erie. General Harrison was himself a student of medicine, but was compelled to relinquish it and fight the Indians. General Hull, Governor of Michigan Territory at the time the war commenced, received orders to march from Dayton, Ohio, to Detroit, the capital of Michigan Territory, in the spring of 1812. The army rendezvouzed at Franklin, Urbana, and Dayton, embraced two thousand soldiers, a large number of whom were militia, but a few were regular troops. They were equipped with flint-lock muskets and bayonets, side arms and knives, flint-lock pistols and swords. They carried twenty-five pieces of artillery. The commissary was equipped with tents, wagons, flour, meal, cattle and hogs. These followed in the train behind the army on the march. They were well equipped with horses and nearly the whole force was mounted. The cattle and hogs were killed as needed on the march. Sleds as well as wagons were used when the roads were very muddy, and bridges were built by the engineer corps which accompanied them. Most of the streams, however, were forded. The march was up the AuGlaize River to Fort Defiance, down the Maumee River to Fort Miami, and thence along the western shore of Lake Erie just west of the marshes, which extend from the Maumee Bay at the mouth of Maumee River to the Village of Brownstown, eighteen miles below Detroit.

Each company, or legion as they were called at that time, was accompanied by a surgeon who was usually commissioned as ensign or lieutenant in accordance with what is now called the contract plan. The chief medical officer was a Doctor Foster, and he had some twenty medical officers in his whole command. These men were mostly educated in the offices of general practitioners, and received their license to practice from state or territorial district medical societies, a few of them had attended lectures in Philadelphia and New York, the majority of them were men with good common school education and who dissected and learned anatomy from Wistar's work written in Philadelphia and which contained no illustrations. Their surgery was derived from Bell's "System of Surgery," a work written by the distinguished surgeon of that name in Edinburgh and London. They learned practice by reading the writings of Cullen, professor of practice in the University of Edinburgh, and the special writings of Benjamin Rush, on fevers.

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*Read before the WAYNE COUNTY (Detroit) MEDICAL SOCIETY, January, 1907.

The army under Hull was composed of hardy frontiersmen, nearly all of whom had seen service against the Indians. Hull, himself, had been an officer in the Revolution, but most of the officers under him had derived their experience in Indian campaigns. The troops were all examined physically as to their fitness to endure the fatigues and dangers of an arduous campaign. He arrived at Detroit about the 1st of July with a large portion of his army sick and enfeebled with malaria and dysentery. He established two hospitals in Detroit which, however, were only old residences whose occupants had been evicted to make a place for his sick soldiers. He established a camp and took possession of Fort Lernoult, where the postoffice now stands in the city of Detroit. After his medical staff had gotten the army into a fairly good condition of health and he had taken on a large number of Michigan and Canadian militia, the whole army moved over to Sandwich and his headquarters were established there and a large camp laid out. He reconnoitered with a view of attacking Fort Malden, a ruin now, just this side of the village of Amherstburg, but for some reason which he attributed largely to sickness among his men, he succeeded in throwing his forces only as far down the river toward Malden as the River Canard. In his rear, along his base of supplies in the State of Ohio, he had left spies to keep his line open, and about three weeks after he had been located in Canada he learned that his reinforcements of two hundred men with cattle, flour, whiskey, and medicines for the entire army were at the River Raisin, but they could not make the journey through and cross the Swan Creek Huron marshes to Detroit without an escort. With difficulty General Hull found it possible to detach Major Van Horn with two hundred men from his army in Sandwich to open the route and relieve Lieutenant Brush at the River Raisin, where the city of Monroe now stands. Major Van Horn had in addition to his regular militia a number of sick officers who were unable to endure the campaign and were permitted to return to Ohio in the hope of recovering their health.

Two surgeons, Edward Roby and William Allison, accompanied Van Horn's command in this expedition to relieve Lieutenant Brush. Major Van Horn was informed when he arrived at Ecorse that British and Indians had possession of the ford at Brownstown, and he sent forward Captain McCulloch with a small detachment of troops to reconnoiter. McCulloch was ambuscaded and killed and scalped by the Indians near where the village of Trenton is now. Van Horn continued his march in three columns about one hundred yards apart, with the sick officers and their families and the surgeons in the middle column. At Brownstown two creeks had to be forded; after crossing the first one just before entering the village he was fired upon by Indians in the tall grass and in the tree tops under the command of Tecumseh, and regular British soldiers located in an adjacent cornfield under Major Muir. The surprise was complete, and a large portion of Van Horn's command was killed. The two surgeons, Roby and Allison, defended their patients heroically, using their side arms to the limit, but were tomahawked and scalped by the ferocious savages. The site where this massacre occurred is now marked by two ten-inch rifles donated by the United States government for the purpose, mounted on concrete pedestals, on the face of one of which is the inscription made by this society and which reads:

> ERECTED BY WAYNE COUNTY MEDICAL SOCIETY.
>
> "To Edward Roby and William Allison, Surgeons in Van Horn's Command, who were here massacred in the performance of duty, August 5th, 1812. Signed, E. L. Shurley, Flemming Carrow, Hal C. Wyman, Committee."

Brownstown is opposite Fort Malden and on the direct line of Hull's communication between Detroit, the River Raisin, and the home of his soldiers in Ohio and Kentucky. Van Horn's troops retreated to Ecorse and there met reinforcements under Colonel Miller, accompanied by surgeons McLaughlin, Farraday and O'Fallon. They immediately returned to the fight at Brownstown and met the British and Indians under Tecumseh and Major Muir at Monguagon, where a hard battle was fought and the British and Indians defeated. Some sixty men were wounded. The surgeons dressed their wounds with simple cerate and tow, loaded them into boats, and under cover of the night brought them up the river to the hospitals in Detroit. At the battle of Brownstown a number of men were wounded with arrows which the Indians carried into the tree tops, wrapped in fawn skins, and fired upon the troops with strong bows. A number of the wounded at Brownstown were massacred and were buried at divers points where they fell along the trail from Brownstown to Monguagon. Tecumseh sought in this fight vengeance which he vowed after his defeat at Tippecanoe the year before, and for his skill and savagery was made a brigadier general in the British Army. A few days later both the Van Horn and Miller expeditions having failed to open the route for supplies and reinforcements to the River Raisin and to General Cass, and McArthur having disappeared with a considerable force, some six hundred men, on the high trail between Detroit and the River Raisin, the trail which went out by way of Dearborn and then south by way of Flat Rock to the River Raisin, Hull surrendered the city of Detroit, but not until he had brought his army from Sandwich over to Detroit, had manned the guns in the fort and received the fire from British batteries at Windsor and a strong force of British and Indians on this side of the river between the fort and Springwells. Most of the men in the fort were sick with malarial fever. Doctor Foster, the chief medical officer, was prostrated with the fever. Doctor Reynolds, who was himself ill, and was carried about on a cot to the bedside of the patients to whom he prescribed, was the first man killed inside the fort. A cannon shot from across the river tore him to pieces. This seemed to have a very disheartening effect upon General Hull, but the fact that his line of communications with Ohio was occupied by the British and Indians and that he could get no relief from Cass or McArthur led him to surrender the fort.

This is no occasion to discuss the awful consequences which this act involved, but nothing that had occurred to American arms since the period of the Revolution fell with more disheartening force upon the people of the United States than this surrender of General Hull. He was carried a prisoner to Montreal, was exchanged for thirty British officers who had been captured along the Niagara frontier and at other points, was tried by Court Martial and sentenced to be shot. This, however, was remitted, and his name was stricken from the army. Later a commission in Congress reconsidered his case and he was exonerated from all blame.

It is probable that he acted wisely, in view of the fact that his medical stores had been exhausted, that new ones were cut off by the British and Indians, and that the fields and forests about Detroit were swarming with thousands of Indians who would have massacred not only the garrison but the sick and defenseless women and children who constituted a greater part of the population of Detroit. The British continued to occupy Detroit until the battle of Lake Erie. They suffered just as much in Fort Malden and Detroit and in Brownstown with fever and dysentery as did the American troops.

In January, 1813, General Harrison, who had fortified a camp near Fort Miami on the Maumee River and named it Fort Meigs after the Governor of Ohio, sent a force under General Winchester, to attack the British at Fort Malden. The plan was to march down the Maumee River to its mouth on the ice, then up the lake shore on the ice to the River Raisin, where there was a camp of British soldiers, and attack them. This force consisted of twelve hundred men and was accompanied by five medical officers. They were successful in driving off the British and Indians and taking possession of Frenchtown, where Monroe now stands, on the 20th of January. On the night of the 21st, while they were encamped and only partially fortified, they were attacked by British and Indians and defeated. The entire command was surrendered to General Proctor who had crossed the river from Malden to Brownstown, made a hurried march upon the Americans and caught them unawares. It is said that the American soldiers were having a great jollification with the squaws and Frenchwomen at the time they were attacked. General Proctor accepted the surrender of Winchester's command as prisoners of war. He gathered the well men into a corral upon an island in the River Raisin, the sick and wounded were under the charge of medical officers and a detail of attendants in the houses of the French inhabitants which had been converted into hospitals. Proctor promised to leave a strong military guard to protect his prisoners on the island and the sick in the hospitals and the medical officers, but he neglected to do so. A number of the sick were loaded into sleighs and started with his troops for Malden, but the Indians fell on them and tomahawked them. They tomahawked all the soldiers excepting about one hundred and fifty who broke through the savage horde and retreated to Fort Meigs. A part of the prisoners followed the British trail to Malden hoping for protection from the savages by the rear guard of Proctor's force, but they were massacred all the way, and today when a new house is built or a cellar dug anywhere on the route of Proctor's troops from the River Raisin to Brownstown the bones of the Ohioans and Kentuckyians are found. Doctor Todd, of Lexington, Kentucky, surgeon in Winchester's command, was dragged from the bedside of his patients and tomahawked by the savages on the bank of the River Raisin about two hundred feet from the spot where the obelisk erected by the citizens of Monroe to mark the awful massacre now stands.

In the summer of 1813 Commodore Perry built a fleet of six vessels at Erie. They were equipped with cannon and muskets, and manned with sailors and marines. Two surgeons accompanied the flag ship, the principal officer being Doctor Brown. They sailed down Lake Erie and rendezvoused at Put-in-Bay, and there they waited patiently for a strong fleet built by the British at Fort Malden, officered by men who had seen service with Nelson, and armed with long guns, two of which stand in front of the City Hall in Detroit. The British fleet sailed down the lake from Malden on the 10th of September, 1813; at about a quarter before 12 Perry sailed out of Put-in-Bay and met the fleet about five miles to the northwest, and immediately engaged them. A desperate sea fight followed and the British surrendered all their vessels, marines, sailors and officers to the American Commodore. Doctor Parsons was assistant Fleet Surgeon for Perry, the Chief Fleet Surgeon, Brown, being ill. Nearly one-third of Perry's force was in the cock-pit sick with fever and dysentery when the fight began. He lost in wounded and killed one hundred and nineteen men. Of these ninety-six were wounded. All of the dead except the officers, one of whom was Midshipman Brooks, a medical officer, were buried at sea. The British loss I have not learned. Commodore Barclay, the officer in command of the British fleet, who had already lost an arm with Nelson, was wounded in the hip and shoulder. His shoulder blade was torn away. Doctor Parsons, the Fleet Surgeon, with assistants was in charge of the hospital cock-pit on board the Lawrence. The solid shot from the British passed through and through the place where he was at work dressing the wounded, and killed many of his patients. During the three hours' fighting on board the Lawrence he performed six amputations of the legs, all of which recovered. After the battle was over the vessels were sailed and towed into Put-in-Bay and there the wounded remained to recuperate. Of ninety-six men wounded in this action under the care of Doctor Parsons, all but three recovered, and he attributes these fine results to the pure air, fine water and the enthusiasm which the commander of the fleet inspired in his officers and men.

The malarial fevers disappeared with the coming of frost. The dysentery was treated with spikenard and hot milk. Thousands of head of cattle were grazing in the marshes along the Portage River, where Port Clinton is now, and these furnished the meat and milk rations for the sick. Flour and meal were obtained from mills at Urbana and Upper Sandusky, and the windmills along the Detroit River, which were nearly all owned by the French habitans, and stretched their great arms a hundred feet into the air from Lake Saint Clair to Bois Blanc Island. There was plenty of corn and wheat. Corn was the principal diet of the troops.

A Mr. Brown who was an eye witness of the battle of Lake Erie and who visited Detroit and Malden immediately after they were evacuated by the British and were in possession of Harrison's victorious troops, commenting upon the sickness incident to the campaign, criticises severely the commanding officer, General Harrison, for not giving more care to the hygiene of his troops. He announces that General Johnson, who marched from Kentucky to the Moravian towns on the River Thames in Canada and there defeated Proctor and killed Tecumseh in their last stand before the Americans, marched his whole troop—one thousand strong—back to Kentucky with the loss of only three men from sickness. And he speaks of the Lewis and Clark expedition which journeyed from Saint Louis to the mouth of the Columbia and lost only one man, and of expeditions in Pennsylvania surveying the lands with parties of fifty and sixty men and no illness, because they were not detained in camps. He severely criticises the sanitary conditions of the camps at Malden and Detroit and at Fort Meigs and attributes all of the illness to a local infection peculiar to camp life.

In this respect, as a student of the campaign of Harrison and of the British Commander Proctor, he was not essentially different in his views from those who visited our camps at Tampa, at Jacksonville, and Santiago during the Spanish War. He inveighs against camps, says the troops should be kept moving because the camps become seats of pestiferous infection, and he criticises General Harrison and the Congress of the United States for not putting at the head of the army competent medical men, and a competent force of medical officers.

I need not mention to you, gentlemen, the remarkable results obtained by Doctor Parsons in the treatment of the ninety-six wounded men at Put-in-Bay. These wounds were by solid shot, grape shot, leaden balls, and splinters, and were all of a serious open character, not a few of them were shot wounds through the neck and chest; the treatment was cerate and tow. The inflamed wounds were treated with wet dressings and whiskey. Internally the patient received bark, iron and wine—Madeira. Several pipes were obtained in Detroit for that purpose.

So many soldiers died from infectious diseases in the camps about

Fort Shelby in Detroit and were buried in the field roundabout that every time there is an excavation anywhere within the half-mile circle of the city human bones are exhumed. During the Indian wars and the War of 1812 at Detroit it is said that thirty thousand soldiers lost their lives.

Detroit, 46 Adams Avenue, West.

TRANSACTIONS.

CLINICAL SOCIETY OF THE UNIVERSITY OF MICHIGAN.

STATED MEETING, FEBRUARY 6, 1907.

THE PRESIDENT, HUGO A. FREUND, M. D., IN THE CHAIR.
REPORTED BY DAVID M. KANE, M. D., SECRETARY.

REPORTS OF CASES.

A CASE OF ARTHRITIS DEFORMANS TREATED BY BIER'S PASSIVE HYPEREMIA.

DOCTOR FRANK SMITHIES: The following case entered the University Hospital, in Professor Dock's service, November 12, 1906, complaining of swelling, tenderness, deformity and pain on movement of her joints—particularly the shoulders, elbows, wrists, fingers, hips, knees, ankles; inability to walk; dyspepsia; chronic constipation. The affection had extended over a period of about two years.

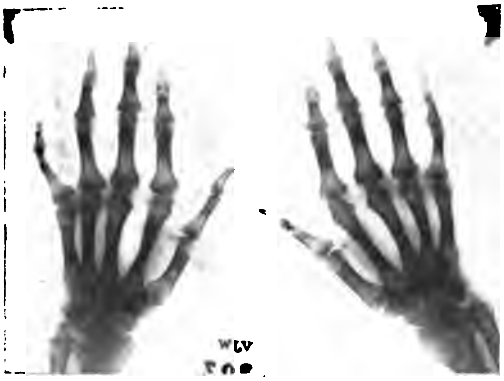

FIGURE I.

The patient is a female, married, aged twenty-eight, of Irish birth. With exception of one sister, who died of "quick consumption," her family history is negative. There is no history of rheumatism on either side. The patient had scarlet fever and measles when a child, but made good recovery. She was generally well up to within last two years; had occasional "sore throat"; has always worked hard; menstruated at fifteen, and has been regular up to time of present illness; has two children, both of whom are in excellent health.

The present affection began about two years ago. She first noted that her knees were painful and "lame." There was no swelling, no redness, and no fever. The pain later spread to the ankles, the shoulders, the elbows, the wrists, the hips, and the finger joints, lasting a day or two in each. It would disappear from one joint only to reappear in another. The pains were rather sharp and were brought on by movement. The patient took patent medicines, in fact "took everything," for a year with little benefit. She occasionally consulted a doctor, who gave her medicines which did not help her much. During all these attacks the patient does not think that she had any fever or sweats. Her condition became gradually worse. She began to note that her joints—especially the ankles, knees and the elbows were "growing big," and she experienced increasing difficulty in getting about. It became necessary for her to use a cane. Finally, she was unable to walk with the cane, and for the past four months she has not been able to get about at all. She says that her joints are bigger than they have ever been, and that the greatest pain is on motion. She adds that damp weather causes great discomfort. She has lost over thirty pounds in weight during the last two years.

EXAMINATION ON ENTRY.

General.—The patient lies in the dorsal position, with the knees drawn up, forming an angle of about 110° with the abdomen. The arms are flexed across the abdomen, the right rather more than the left. The skin is pale sallow throughout, deepening over the upper thorax; it is shiny over the hands, especially over the metacarpophalangeal joints; over the legs, the skin is tense and shiny over the knees, becoming scaly over the lower legs and feet. The feet are small, the nails very thick, stained brown, and marked by transverse ridges; the skin on the plantar surfaces is greatly thickened, cracked and fissured, the fissures being bordered by thick, white, adherent scales.

Joints.—The patient can move her head freely from side to side and forward, but there is some difficulty in throwing the head back—no definite pain, only a sensation of stiffness. The shoulder-joints on both sides appear somewhat globular, the left more so than the right, the heads of the humori being large and rounded. There is slight tenderness on pressure over both joints. The patient can abduct the arm on the left to form an angle of about 45° in the axilla; on the right an angle of about 30° in the axilla. Abduction beyond is painful. Movement of the humori forward and backward is moderate, but painful. There is no crepitus in either joint. The elbows are spindle-shaped, the right appearing rather fuller than the left; extension to about angle of 110° on the left; on flexion the finger tips can approach within about six inches of the head of the humerus. There is pain on attempting forced flexion; no crepitus; slight tenderness on moderate pressure over the bony parts of the joint. Above the internal condyle of the humorus is a small, roundish mass, about two centimeters in diameter, not connected with the skin, hard as cartilage, and seemingly connected with the deeper muscles. It is smooth, slips beneath the fingers, and is not tender to pressure. Just above the elbow-joint, anteriorly, is a smaller but similar mass. The left wrist is rather puffy, and there is disability on extension; there is slight tenderness on pressure. There is moderate atrophy of the interossei. The metacarpophalangeal articulations are slightly puffy, especially the outer two; they are rounder, and are tender on moderate pressure; motion limited slightly on flexion, moderately on extension. The thumb is least affected. The joints formed by the first and second phalanges are spindle-shaped, particularly the inner three. The skin over them is puffy and slightly cyanotic; there is no pitting on pressure; flexion is not quite to a right angle, extension not complete. Pressure causes moderate pain. The ends of the phalanges are thickened, rounded, and here and there are small local tuberosities.

On the right, the condition throughout the arm is similar to that on the left; the joints, as a whole, show less swelling, but are much more painful either on motion or on pressure. The motion is less free.

The left hip-joint is slightly swollen; the head of the femur is rounded. There is moderate tenderness on pressure over the greater trochanter. Extension possible to about 150°, flexion to about 110° with the trunk. Forced movement beyond causes great pain. The left knee is globular in shape, and is fuller on the inner side; motion is very slow and evidently difficult. Extension is possible to about 130° at the popliteal space; flexion to about 60°. On palpation the joint feels tense, especially at the front. The patella is indistinctly made out; the articular surfaces are thickened and show localized abnormal tuberosities; pressure throughout is painful; there is no crepitation during movement. The left ankle looks puffy over the outer malleolus; motion is fairly free, but painful; crepitus posteriorly. The toes are short, stubby, and slightly tender along the base.

The right hip does not seem as swollen as the left, and admits of rather freer motion in all directions, and is less tender to pressure. The right knee is in general similar to the left; flexes to about a right angle, and extends to about 160°. There is about as much pain on movement as on the left. The right ankle is not swollen, the movement is free with slight pain. On the flexor surface of the foot, about midway between the ankle and the base of the toes, is a small, rounded mass, about one inch across, similar to the masses noted above the left elbow-joint.

Thorax.—Lungs: Negative. Heart: Slight degree of myocardial weakness.

Abdomen.—Marked emaciation of muscular elements, but otherwise negative.

Blood.—Red cell count, 3,040,000; white cell count, 2,800; hemaglobin, 75 per cent.

Urine.—Negative.

Stomach.—Moderate hypoacidity and retention.

Radiograph.—Thickening of periarticular tissues; atrophy of articular cartilages and ends of bones; nodular thickenings near articular ends of bones; Haberden's nodes in hands (see Figure I); numerous sesamoid bones adjacent to joints in hands.

Node removed from left arm, just above internal condyle of humerus, proved to be of lymphatic structure, showing marked hyperplasia and increase in fibrous elements (Doctor Warthin).

DIAGNOSIS.—Arthritis deformans, of chronic, progressive type.

TREATMENT.

General.—Rest in bed; full, mixed diet; fresh air.

Medicinal.—Tincture of nux vomica and tincture of gentian compound before meals; hydrochloric acid after meals; gastric lavage, and Fowler's solution in ascending doses.

Local.—Bier's passive hyperemia to involved joints, the hyperemia being produced by constriction resulting from application of elastic bandages proximal to the joint being treated. For the first two days the stasis was only maintained for half an hour at a time, twice daily, each joint being successively treated. After removal of the elastic bandages, the joints were massaged with warm olive oil, for fifteen minutes at a time. But moderate compression was exerted when the bandages were applied, and the parts involved in the stasis were carefully watched. After the first application, the pain in the joints became less, and after the second day the swelling had almost left the larger joints, leaving, however, a moderate degree in the wrists and the fingers. The tenderness had noticeably decreased, and the patient rested comfortably in bed and was able to sleep at night. The time of application of the bandages was gradually lengthened, until by the end of the first week stasis was being maintained for two-hour periods, at each joint, twice daily. It was found that the continuance for a longer time caused some discomfort, and slight edema of the ankles.

Progress of the Case.—By the end of the first week the pain and tenderness had entirely disappeared from the joints involved; there was still slight redness and swelling of the fingers, but measurement of the remaining joints revealed the fact that they were from one to three centimeters smaller than before, according to the joint measured. Movement was much more rapid with less discomfort. The greatest improvement was at the elbows and the wrists. Crepitation had entirely disappeared from the joints in which it had been previously noted.

Stasis was persisted in, and in three weeks the patient could move about freely in bed, could feed herself, write letters, and sit up, in bed or in a chair, without support. There were no joint pains, the swellings had entirely disappeared, and no new joints were involved.

From this time the improvement has been gradual and continued. At the present writing, the patient gets about very easily in a rolling chair, without aid. She can feed herself, arrange her hair, dress herself, get out of bed, take a tub bath with slight aid, and with some support can walk several steps. The range of movement has increased markedly at the wrists, elbows, fingers, knees, and ankles, less so at the shoulders and the hips. Perhaps the fact that stasis was difficult and imperfect at these joints may explain the slow improvement.

A CASE OF INFECTION WITH ACTINOMYCES BOVIS.

Doctor Frank A. McJunkin: Having had three cases of actinomycosis in the University Hospital within the last few months, one is led to think that the disease is more common than the number of cases reported would indicate, considering the difficulty of diagnosis observed in these. The first case (Doctor Canfield's clinic) was diagnosed by Doctor Warthin from curettings taken some weeks after her entrance into the hospital; the second case, in which the spine and internal organs were involved, was not diagnosed until patient came to autopsy. In this one (Doctor de Nancrede's clinic), the diagnosis was made by myself March 10, 1907, two months after the patient's entrance to the hospital, although a probable clinical diagnosis was given by Doctor Darling one month previous.

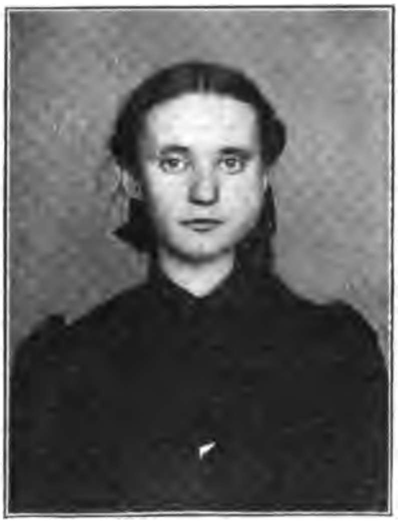

Figure I.—Three Months After Beginning of Disease.

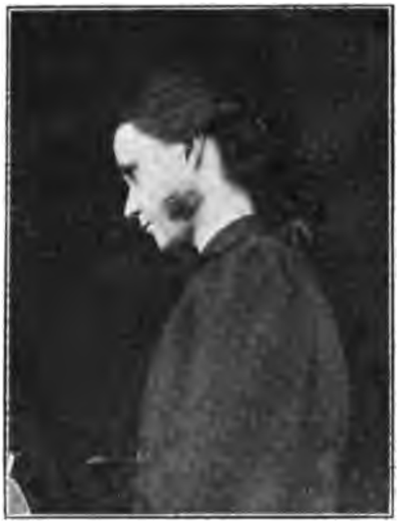

Figure II.—Four Months After Beginning of Disease.

This patient, an American female, aged seventeen, came under observation January 15, 1907, giving the following history: During the early part of August, 1906, she was visiting in the country and remembers having frequently placed straws, grass-blades, et cetera, in her mouth. She returned to her home, a town of ten thousand, and remained well until the first of September. At this time she noticed some soreness about the first molar tooth of lower jaw, left side. This increased, and January 2, 1907, the tooth was extracted. The crown was decayed, but no trouble was found about the root.

On entering the hospital January 15, 1907, patient's left cheek was found to be diffusely enlarged, as shown in Figure I. Upon looking into the mouth, which could be opened just sufficiently to admit the finger, there is seen some widening of the alveolar process in the molar region, and opposite the last upper molar there is a small opening which exudes pus. On January 17 this opening in the cheek was enlarged and packed with iodoform gauze. The condition grew worse, and February 15, one month after entering the hospital, she presented the appearance shown in Figure II, and at this time an opening was made through the skin by Doctor Darling, who noted small granules one millimeter in diameter. These he sent to me with the suggestion that they might contain calcareous matter. I did not identify these as actinomycotic granules at that time. March 10 I obtained a number of these from the wound, which yielded me an organism with the characteristics which I will now describe.

Origin.—Granules coming from a sinus leading into the soft tissues of the cheek. No mycelial threads could be found in discharge, except in the granules.

Form.—Mycelial threads and short coccus-like forms. The longest threads are five-tenth millimeter long. The average diameter is two microns. There are a great many true dichotomous branchings. In bouillon it grows in short threads, many of which show swelling. No club formation observed (I have not thoroughly examined as yet the curettings taken from the wound).

Motility.—Nonmotile.

Sporulation.—It does not form endospores, but forms gonidia or gonidia-like bodies, the coccus forms.

Anilin dyes.—Stains with all common anilin dyes and by Grams method.

Growth.—I was very fortunate in getting a pure culture of the organism without difficulty. I took the granules as they came from the wound under aseptic conditions, washed them in sterile water and then transferred them to slant agar tubes, pushing them below the surface with a platinum loop. On the third day the filiments were seen to be extending into the depths of the agar away from the surface. The growth increased to the size of a half pea. From this subcultures were made in other media. In bouillon it grows at the bottom of the tube, without clouding the media, in the form of rather dense, irregular masses. On one per cent glucose agar it forms a growth which extends into the agar. Little growth is apparent at the end of forty-eight hours under aerobic conditions, while anaerobic cultures on the same media form a distinct growth in this time.

Oxygen Requirements.—The nature of the growth of this organism, as just described, characterizes it as a facultative anaerobe.

Temperature.—In two weeks no perceptible growth at the room temperature.

Thermal Death Point.—Moist heat at 60°.

TWO MINUTES.	FIVE MINUTES.	TEN MINUTES.	FIFTEEN MINUTES.
Growth.	No Growth.	No Growth.	No Growth.

CONTROL ONE.	CONTROL TWO.
Growth.	No Growth.

Here I wish to speak of the method I used in making all subcultures; the majority of tubes I inoculated with a filtered suspension of the germs failed to show any growth. In transplanting I took small macroscopic particles of culture. In testing the thermal death point I used a thick suspension containing macroscopic particles.

Pathogenesis.—Inoculated animals have not yet been examined.

The question now arises as to where this organism belongs. In 1877 Bollinger and Harr[1] applied the generic term Actinomycoses bovis to the branching organisms forming the characteristic granules (drusen) above described. In 1905 Homer Wright[2] reported thirteen human cases and two bovine, from all of which he isolated a branching organism which formed these granules. Many others have described similar branching organisms with formation of drusen, but have given them different specific names based on biologic differences which do not seem sufficient to warrant such a division. We have here an organism with true dichotomous branches, the next most striking and constant feature of which is the formation of "drusen." This last factor certainly separates this organism from the other streptothrices. If cultural or other differences of sufficient constancy importance are found to exist, these species should be placed under the germs Actinomycoses bovis. If not, the general name becomes also a specific one. The following classification, essentially that of Migula,[3] shows its position in the vegetable kingdom, according to these conceptions.

Division I.—Algæ (Chlorophyl present).
            Saccharomycetes (yeasts).
Division II.—Fungi.
            Hyphomycetes.

Division III.—Crystogamous or flowerless plants.
    Division 1.—Vascular (ferns).
    Division 2.—Cellular (mosses and liverworts).
Class I.—Agrogens.

Division IV.—Bacteria.
Class II.—Thallophytes.

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[1] Bollinger and Harr: *Centralblatt f. d. Med. Wissensch.*, 1877, Volume XV.

[2] Wright: *Journal of Medical Research*, Volume XIII.

[3] Migula: Engler & Prantl's "Naturlichen pflanzenfamilien," 1896.

Division I.—Unbranched and false branching.
  (A) Coccaceæ.
  (B) Bacteriaceæ.
  (C) Chlamydobacteriaceæ.
  (D) Beggiatoa.

Division II.—True Dichotomous branching.
    Influenza.
    Leprosy.
  Mycobacterium.
    Swine erysipelas.
    Diphtheriæ.
    Tuberculosis group.

Division III.—Streptovarix.
  Actinomycosis bovis.
    (Bollinger, 1877.)

ORIGINAL ABSTRACTS.

SURGERY.

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CARCINOMA OF THE BREAST.

The *Annals of Surgery* for July contains nine papers on this subject. The first is entitled "The Results of Radical Operations for the Cure of Carcinoma of the Breast," by Doctor William S. Halstead, of Baltimore. He defines a radical operation as one in which the breast, pectoralis major and minor muscles, and axillary and superclavicular glands are removed. All short of this would be partial, according to the tissues removed. He bases his statistics upon two hundred thirty-two cases operated at Johns Hopkins Hospital. The basis established for a cure is freedom from recurrence for more than three years after operation. Seventy-five of the patients are alive and well, without recurrence; fourteen had metastasis more than three years after the operation, making a total of eighty-nine cases that passed as cured beyond the three-year limit; one hundred twenty-one died from local or regionary recurrence, and internal metastasis. This reduced to a percentage basis gives 32.3 per cent of cures. The history of eighteen cases could not be followed; if these were subtracted from the whole number the percentage of cures would be 53.6 per cent. The improvement in end results by complete operation is much better than appears because more advanced cases are operated. When the glands above the clavicle become involved a cure is not to be expected.

The second paper is a composite composition by Doctors R. B. Greenough, C. S. Simmons, and J. D. Barney, giving the end results of three hundred seventy-six primary operations for carcinoma of the breast at Massachusetts General Hospital, which covers a period of ten years, from 1894 to 1904. These have all been traced, and their condition ascertained. Sixty-four are alive and well with fairly good use of the arm. While some complain of swelling in the hand and arm. it is gratifying to note that this is not a symptom of recurrence. Seven died after the three-year limit without recurrence, and should be classed as successful cases, making seventy-one cured, about twenty per cent. The importance attached to palliative operations should be noted. There were fify-six such cases where some of the diseased tissue was supposed to be left behind. Four of these cases are well without recurrence. Another important fact is that no local recurrence took place in fifty-two per cent of all the cases. This shows that if operation had been performed before metastasis had taken place more than half of them would have been cured.

The third paper, by Doctor Albert J. Ochsner, of Chicago, gives the final results in one hundred sixty-four cases of carcinoma of the breast, which were operated during the past fourteen years in the Augustana Hospital. Only ninety-eight of these could be located by correspondence. Fifty-four of these are still living, and, with two exceptions, are free from return. Ten complain of swelling of the arm, and five died of shock at the time of the operation, which shows that chances were taken with desperate cases.

Doctor Nathan Jacobson, of Syracuse, has reported a number of peculiar cases, from which he draws the following conclusions: "As far as I am aware there is nothing which either the surgeon or the pathologist can discover at the time of the operation which will make it possible for him to determine the degree of malignancy of the affection aside from the rapid course the disease has pursued up to the time of operation." "Withal, however, as we review the results of operative procedure undertaken for carcinoma of the breast, we can warrant the assertion that the present operative technique, developed as it has been along the lines of pathologic research, has fully verified our expectations and justifies the statement that except in the very acute cases a timely operation radically performed will completely remove the carcinomatous disease and prevent recurrence in the majority of cases."

Doctor John Chadwick Oliver, of Cincinnati, asserts that if many lymphatic glands are affected, the disease will probably recur even after a thorough removal of all the muscles and axillary contents. He also directs attention to the danger of inoculating tissues by setting cells free at the time of operaion.

Doctor Lewis S. Pilcher, of Brooklyn, is not so skeptical about superclavicular involvement being incurable. He reports three cures of this type.

Doctor Joseph Ranschoff, of Cincinnati, reports a number of very late recurrences after operation for carcinoma of the breast. Sixty-two fellows of the society report thirty-seven cases of recurrence after six years. Bull reports one case where general metastasis was found nineteen years after operation.

Doctor Henry R. Wharton, of Philadelphia, contributes a paper on carcinoma of the bones, following carcinoma of the breast. Primary carcinoma of the bone is extremely rare; whereas, secondary metastatic carcinoma of this tissue is not uncommon. It may occur months or years after the removal of the primary tumor. The infection may occur by direct extension of the growth, or by localization of carcinomatous emboli. The bones most frequently the seat of secondary metastatic carcinoma are the vertebræ, femur, ribs, humerus, and cranial bones. Dowd reports twenty-nine cases operated upon for carcinoma of the breast, in five of whom symptoms of spinal metastasis developed.

The general opinion prevails that radical and careful operation will give the best results. Early operations before metastasis has occurred will give a large number of cures. C. G. D.

WHY GASTROENTEROSTOMY IS NOT A HARMLESS OPERATION.

UNDER this question Portis discusses, in the *Annals of Surgery* for December, 1906, the effects of gastroenterostomy.

He remarks that in the mad rush the conservative indications against such a procedure have been too often forgotten. One advises the operation for gastroptosis; another for chronic catarrh; others for hysterical vomiting, nervous dyspepsia, et cetera.

He declares the interference with the physiology of digestion which such an operation entails is not well tolerated. Gastric digestion, the churning process of the digestion, the natural emptying of the stomach, the excitation of the flow of pancreatic juice and bile by the presence of hydrochloric acid in the duodenum—all these processes are affected by gastroenterostomy. Furthermore the operation is said to have caused uncontrollable vomiting, diarrhea, jejunal ulcer, pneumonia, and infarcts, and occasionally the vicious circle.

The author's conclusions are:

(1) The stomach may be looked upon as an organ for the protection of the bowel. The normal functions cannot be improved upon by any operation, and gastroenterostomy is at all times a dangerous operation.

(2) The functional disorders of the digestive tract which occur after gastroenterostomy and may seriously interfere with nutrition, and the severe diarrhea which may come on, are due not only to the premature emptying of the stomach, but also to the failure of neutralization by the bile and pancreatic juice of these acid products. The deficiency of bile and pancreatic juice is due to the absence in the duodenum of the hydrochloric acid, which stimulates both of these to flow.

(3) The numerous recorded cases of ulcer of the jejunum following gastroenterostomy and their persistence of symptoms, if not of fatal termination, lead us to advise gastroenterostomy only as a last resort.

(4) The neurasthenic individuals who suffer from chronic dyspepsia not only are not benefitted by gastroenterostomy but are made worse. This also applies to the dyspepsia due to imperfect mastication.

(5) The so-called atonic dilatation of the stomach and gastroptosis, either alone or as a part of a general enteroptosis, never are benefitted by gastroenterostomy.

(6) No operation is indicated in acute ulcer, unless perforation is imminent or has occurred, or serious hemorrhage compels it.

(7) Gastroenterostomy is not indicated in chronic ulcer of the stomach, unless there are repeated small hemorrhages which menace life, grave adhesions, or persistence of marked symptoms even after prolonged and thorough medical treatment.

(8) Gastroenterostomy should always be done where the natural evacuation of the stomach is impossible and pyloroplasty or gastroduodenostomy are not feasible. This includes the cases with mechanical obstruction due to pyloric stenosis, and malformations due to hourglass contractions or disabling perigastric adhesions. When the operation is done it is best to close off the pyloric opening. F. B. W.

PEDIATRICS.

ARTHUR DAVID HOLMES, C. M., M. D.

WHY PERCENTAGE FEEDING FAILS.

Lowenburg (*Journal of the American Medical Association,* February 16, 1907) says the profession almost unanimously are agreed that cows' milk modified so as to resemble human milk is the best substitute when adapted to the individual infant, and the causes of failures which tend to bring the percentage method into disrepute are accounted for by the confusing multiplicity of methods of modification proposed. By the lack of intelligent application of the methods when used, and the tendency to try to follow details and to obtain impossibly accurate percentages, physicians and parents expect gain in weight too soon and the result is disappointing. The physiologic and biologic differences between cows' and human milk are not sufficiently recognized. In fact the physical difference between the curds of these two milks is the crux of the whole problem of infant feeding, and failure to recognize it is the cause of ninety per cent of failures of percentage feeding. Sufficient care also is not given to prevent contamination of the milk supply, and the time between the cow and infant should be shorter. Lack of diagnosis of the cause of indigestion is another potent factor of failure, whether of fat indigestion, protein, or sugar indigestion, which each calls for a different modification. Failure of physicians to think in percentages instead of going by formulas of ounces, et cetera, is likewise a factor. Physicians fail to teach the mother and nurses the details of mixing the various ingredients of the milk formula, assuming that they would not follow them out if instructed. Physicians do not themselves sufficiently supervise the details of feeding, and thus invite failure. Children thus fed should be seen at least once a week and detailed notice taken of the child's progress as regards weight, condition of excretions, amount of sleep, regularity of feeding, et cetera, and every detail of infant hygiene. The easiness of preparation of proprietary foods is another misleading factor. Physicians and parents are deluded by them into losing their sense of responsibility. As a permanent infant food they are a delusion and a snare.

LEUKOCYTOSIS IN WHOOPING-COUGH.

CHURCHILL lays stress on the early diagnosis of whooping-cough by means of a leukocyte count (*Journal of the American Medical Association,* May, 1906). From an examination of one hundred cases he concludes that a general leukocytosis is present in almost all cases; that a lymphocytosis occurs in about eighty-five per cent at some time during the course of the disease; that the lymphocytosis is especially present in the early or catarrhal stage, when it is found in over ninety per cent of the cases. Its presence therefore in a child with a hard, persistent cough is a useful aid in diagnosis. The age of the child, of course, must be taken into consideration in estimating the leukocyte count.

MENINGITIS IN INFANCY.

MORSE (*Journal of the American Medical Association,* Volume XLVI, Number XXV), in a consideration of forty cases of meningitis in which the diagnosis was made in every case by autopsy or by lumber puncture, states that the symptoms of the two types—tuberculous and cerebrospinal—frequently differ from the usual descriptions. The onset of tubercular meningitis may be sudden and accompanied by convulsions or stupor, or it may be gradual, as in the cerebrospinal type. The short duration in many of the tuberculous cases and the long duration in many of the cerebrospinal cases is very striking. Rigidity of the neck, paralysis, spasms of the limbs, Kernigs's sign and increase of cerebral pressure were more marked in the cerebrospinal form, but all other signs, such as temperature, mental state, bowels, vomiting and convulsions were practically the same in both. A positive diagnosis between the two forms is impossible by the symptoms alone and can be made only by examination of the cerebrospinal fluid obtained by lumbar puncture. In twenty-five per cent of the tuberculous cases there were neither history nor signs of tuberculosis. Lumbar puncture had no influence on the course of the disease. Its beneficial effect in relieving symptoms was only temporary in both forms.

THE PUBLIC SUPPLY OF PURE MILK FOR INFANTS.

McCleary suggests (*Lancet,* August 18, 1906) that the milk in infants' milk depots should never be supplied in such a way as to run the risk of discouraging breast-feeding. Care should be taken to admit to the depot only those infants for whom satisfactory breast-feeding is impossible to secure. He found that at the Battersea depot many mothers attended who were perfectly able to nurse their offspring. He always assures the parent that depot milk is but a poor substitute for mother's milk. If the milk is supplied to all applicants without discrimination we lay ourselves open to the charge that we discourage breast-feeding, and are therefore guilty of *lèse maternité.*

OPHTHALMOLOGY.

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THE OCULAR COMPLICATIONS OF MUMPS.

John H. Woodward, M. D. (*Annals of Ophthalmology,* January, 1907), gives Doctor Rider, of Rochester, credit for being the first American to record observations of an invasion of the visual apparatus by mumps. In 1872, before a meeting of the New York State Medical Society, he reported two cases of dacryoadenitis. Hatry, in 1876, published ten cases of neuroretinal disease due to mumps, the first of the kind to be reported. In all, about thirty papers and reports have been published.

The author states: The salient fact disclosed by this review is, that far from being the benign malady it is so often assumed to be, epidemic parotitis is a disease endowed with a potency for evil to the visual organs that is not to be despised. The range of its ocular complications extends from abscess of the eyelids to retrobulbar optic neuritis. These morbid processes may terminate in complete resolution and perfect restoration of function, or they may end in atrophy of the optic nerve and blindness of both eyes. The period in the course of mumps during which ocular complications most frequently supervene is when the usually observed symptoms of the disease have begun to subside, or within a few weeks after they have subsided. Abscess of the eyelids and dacryoadenitis, however, have, in a few instances, preceded by a number of hours or days the well-known signs of mumps.

Up to the present time, no perfectly satisfactory explanation of the mode of production of the ocular or other metastases has been propounded. The toxin theory seems to be the most logical, but it is still in the realm of hypothesis. Nothing hitherto observed in the characteristics of an attack of mumps may be construed as an indication that an ocular complication is impending. The treatment of such complications, when they do occur, with the exception of abscess and iritis, seems to have had a very moderate influence upon the course of the malady. The course of the complications, generally speaking, is toward recovery. Those cases which have gone on to a disastrous termination have done so notwithstanding vigorous medication.

A brief summary of the lesions will show at a glance their diversity:

Optic neuritis and neuroretinitis	23 eyes
2 were totally lost;	
2 sustained a marked loss of vision;	
8 made an imperfect recovery;	
11 made a complete recovery.	
Retrobulbar optic neuritis	3 eyes
3 made a complete recovery.	
Atrophy of the optic nerve	6 eyes
4 sustained a marked loss of vision;	
2 sustained a nearly complete loss of vision.	
Iridocyclitis (1 totally lost)	1 eye
Iritis	6 eyes
3 made a complete recovery;	
3 made an imperfect recovery.	
Keratitis (complicating one of the cases of iritis)	1 eye
1 made an imperfect recovery.	
Dacryoadenitis	14 cases
Conjunctivitis	28 cases
Abscess of the eyelid	1 case
Dacryocystitis	1 case
Paralysis of the accommodation	3 cases
Paralysis of extraocular muscles	3 cases
Hemeralopia	1 case
Amblyopia in which ophthalmoscopic examination was not made	1 case
Dimness of vision (Joly)	12 times
Narrowing of color fields (Joly)	3 times
Narrowing of fields of vision (Joly)	5 times
Lesions discovered by opthalmoscope (Joly)	24 times

The author adds a case of neuroretinitis with pathologic report, it being the only case recorded with record of pathologic findings.

The case was one of unilateral (left) optic neuroretinitis, due to infectious parotitis in a girl eleven years of age, resulting in blindness of the affected eye. Enucleation of the eyeball three and one-half years later for proptosis caused by anterior staphyloma.

The pathologic examination showed the case to be one of proliferating neuroretinitis, with complete atrophy of the nerve fibers. The proptosis was a consequence of the increased intraocular tension from secondary glaucoma.

The author concludes with an abstract of the history of all the published cases.

OTOLOGY.

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LEPTOMENINGITIS FOLLOWING RADICAL MASTOID OPERATION.

SPRATT adds another case to the list (*Archives of Otology,* Volume XXXVI, Numbers I and II) of leptomeningitides of otitic origin and which is especially interesting in that the infection took a decidedly unusual course, along the facial canal, and infected first those regions adjacent to the internal auditory meatus. Further the case presented the following points: extensive mastoid involvement with slight pain and tenderness; late onset of the meningitis and rapidity of the course, the patient dying in fifty-four hours after first headache. M. L. C.

MASTOIDITIS IN DIABETIC SUBJECTS, WITH REPORT OF CASES.

RICHARDS reports four such cases (*Archives of Otology,* Volume XXXVI , Numbers I and II), and from these and five others that he has observed, draws the following conclusions:

(1) That the invasion is somewhat characteristic; an acute otitis with persistent bulging of the membrane which does not subside upon repeated incision, and which frequently is accompanied by but little or no pain; a narrowing of the canal due either to sagging of its walls or to thickening from an external otitis. An external otitis may precede the otitis media. Subjective signs of mastoid involvement are slight and patient has only a very moderate inflammatory reaction, indicating a much lowered resistance. Later postmastoid tenderness and headache localized above and posterior to base of mastoid, which indicate extensive destruction and epidural abcess.

(2) Slow development of symptoms and postoperative appearance of wound show marked lowering of tissue resistance.

(3) Codein and dieting are of value in after treatment.

(4) There is very high mortality—sixty-six per cent. Death usually occurs in a few days from coma.

(5) Chloroform is the anesthetic of choice, especially in the plethoric type.

(6) Sugar content of urine may vary after anesthetic.

(7) Dyspnea, seen after anesthetic, is of evil omen.

(8) Speed in operating is essential.

(9) Thorough removal of cells, and if dural plate is involved, remove it as well.

(10) Vascular changes common in diabetics.

(11) The claim that cases showing thirty per cent sugar and over always terminate fatally is not true, nor does presence of acetone and diacetic acid make issue necessarily fatal.

(12) Dyspnea occurring either prior or subsequent to operation is the most valuable prognostic symptom and indicates almost certain death.

His cases were all true diabetics as proven by history and repeated examination, and he urges that care be taken to differentiate such cases from the transient glycosurias without clinical symptoms. M. L. C.

LARYNGOLOGY.

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A DISCUSSION ON CONGENITAL STRIDOR (LARYNGEAL AND TRACHEAL).

In the October (1906) number of the *Journal of Laryngology, Rhinology and Otology* there is an interesting discussion of the above subject.

Turner opens the discussion by a clinical description of the disease, followed by a consideration of the various theories as to the etiology. He says that the disease is characterized by a croaking sound accompanying inspiration, which assumes the character of a high-pitched crow when a more forcible inspiration is taken. Expiration may be accompanied by a short croak when the stridor is loud, but at other times it is noiseless. There are occasionally brief intervals during which no sound is audible even in severe cases, but with this exception the stridor goes on constantly while the child is awake, and sometimes even when he is asleep. Crying and coughing are unaffected. There is not the slightest distress or cyanosis during the attacks. The stridor increases in loudness during the first few months, and after remaining about the same for a few months more it gradually lessens and disappears during the course of the second year of life.

Various explanations have been offered to account for these clinical phenomena: thus we have a reflex laryngeal irritation induced by the presence of adenoids in the nasopharynx; pressure upon the trachea from an enlarged thymus; congenital malformation of the upper aperture of the larynx; an ill coordinated spasmodic action of the respiratory muscles inducing an exaggeration of the normal infantile type of larynx, an acquired deformity.

Turner favors the last explanation. In examining the upper aperture of the larynx of infants he found that the tissues were much softer and more collapsible than they are in adults. The upper aperture of the larynx of a stillborn infant was relatively wider than that of an infant which had breathed. The infantile type disappears as the child develops.

In infants the respiration is irregular in rhythm and in force, due to lack of proper coordination. Anything that produces a sudden increase in the inspiratory effort will produce a crowing respiration similar to that which is observed in congenital laryngeal stridor, due to the more collapsible nature of the upper aperture of the larynx. This will be increased in proportion as the breathing is spasmodic and poorly coordinated.

Ashby, in the discussion of the subject, says that the larynx is provided with two physiologic stops; one at the entrance of the larynx, and the other at the vocal cords. He believes that the stridor is due to a neurosis, the result of a disturbed coördination, the rima glottidis failing to open its portals sufficiently, especially during a vigorous inspiration.

Cautley thought the stridor due to congenital malformation of the upper laryngeal apparatus.

Various opinions were expressed in the discussion as to whether a congenital malformation or a respiratory neurosis was the main factor.

SOME OBSERVATIONS ON THE FOSSÆ OF ROSENMÜLLER.

Thomas L. Brunk (*The Laryngoscope*, August, 1906) recognizes the importance of nasopharyngeal lesions as causes of affections of the lower respiratory tract. He describes a granular condition of the fossæ of Rosenmüller, accompanied sometimes by bands extending across the nasopharynx. The granular tissue in the depth of the fossæ is very often overlooked. He believes that lesions of the fossæ are a very frequent cause of chronic pharyngitis and laryngitis with hoarseness. He cites a number of cases where irritation of the pharynx and larynx were promptly relieved after the correction of the condition of the fossæ of Rosenmüller. Granular material in the fossæ is also an important factor in the etiology of middle ear disease.

The treatment advised by the author is to curette the fossæ by the finger and to break up any adhesions which may be present in the nasopharynx. This is to be followed by the application of a solution of silver nitrate, forty grains to the ounce, then a five per cent solution of camphor-menthol in oil.

NEUROLOGY.

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CONCERNING WRITER'S CRAMP.

J. Mattison Taylor (*Monthly Cyclopedia of Practical Medicine,* July, 1907) gives an outline of "Treatment of Writer's Cramp." His conception of the pathogenesis of the disease is as follows:

"By excessive use of a part, the byproducts of fatigue so affect the vasomotor cell-bodies in the cord that a condition of relative exhaustion results; an anemia or destructive action is induced there which produces a group of symptoms, which are known by various names: professional spasm, occupation neurosis, arm pains, et cetera."

The writer is not inclined to admit that the trouble is located in the centers of the brain. He believes that in all cases there will be found evidences of reflex disturbances, from the overuse of the hand, in the tissues of the back. These are generally in the nature of paresthesia. An important causative factor in the disease is the mental attitude which may be described as psychic hypertension, whereby motor rhythm is marred by excessive action. This motor defect, similar to exaggerated expectant attention, impairs the economic output of force; the action is unduly prolonged and hence follows a cramp. Therefore, he believes that from the outset there are present causes for a local exhaustion which act as a ground for central irritation.

His treatment involves: The correction of the psychic perversion; sedation of the hypertonic back muscles; and massage, carefully directed, with reeducation in coordination; and in certain cases, with contractures, stretching. The author lays stress upon the essential point: that personal skill is demanded in employing or directing the manipulations.

The article is a valuable one when we call to mind the many valueless methods of treatment which have been advanced for the alleviation of these conditions. I. H. N.

MYOTONIA CONGENITA.

L. Pierce Clark and Charles E. Atwood (*New York Medical Journal,* July 20, 1907) have a clinical paper on "A Case of Thomsen's Disease." They believe that there exists in this disease a hypertrophy of the primitive muscle fiber. Accompanying this hypertrophy there is an increase of sarcolemma nuclei. Furthermore they state that "there is no adequate proof that the changes in the muscles are not due to the long-continued increased muscle tone as seen in the various tics and myoclonia. While an autotoxic pathogenesis has been urged of late, most observers still believe that the main fault lies in the congenital muscle deficiency." Clark and Atwood, however, believe that an adequate explanation of the entire disease might be taken to the cerebral cortex, where most problems of disturbance of muscle tone and disorders of motility are meeting solution. As supporting this they say that the "modified influence of the changing mental moods of Thomsen's disease forecasts the psychomotor character of the disorders of the cortex." I. H. N.

DIAGNOSTICS.

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THE DIAGNOSIS OF DUODENAL ULCER.

MOYNIHAN (*The Practitioner,* June, 1907) comments on the fact that duodenal ulcer is far more common than perusal of modern texts leads one to infer. In his own experience he has confirmed the diagnosis in one hundred fourteen cases. In one hundred seven of these cases the ulcer was in the first part of the duodenum; in the remaining cases it was either in the first part at the junction with the second, or in the second part. As a rule, the ulcer is on the anterior surface and extends towards the pylorus. The ulcers vary in size, and may be surrounded by extensive areas of inflammatory reaction. Multiple ulcers are not common; in these most often one finds an ulcer on the anterior surface exactly apposed to one on the posterior surface ("kissing ulcers"). In about forty per cent of cases duodenal ulcers are associated with gastric ulcers. Moynihan suggests that the stomach condition is frequently the primary one. All periods of life are affected; the average age is about thirty-eight years. Men are more frequently affected than are women.

The *symptoms* vary in different patients. Most characteristic and constant is the *pain* or *discomfort* in the upper part of the abdomen, in from one and one-half to four hours after a meal. Burning, knawing sensations with bitter taste in the mouth, with or without *eructations* of food or gas, bitter or acid in taste are common. The pain generally increases in intensity and may strike through the back. It is frequently relieved by the taking of food. Often patients are able to name definite hours at which the pain is the most severe, as 11 A. M., 4 P. M., or 2 A. M. Sometimes the pain is colicky or spasmodic. The writer calls attention to the frequent *intervals of relief from pain* that occur, with characteristic *"attacks"* of varying severity. He suggests that there may have been an attempt at healing in the interim. In the interval patients may gain considerably in weight and strength. *Vomiting* is rather infrequent in duodenal ulcer, unless there is marked stenosis. It is thus rare in cases where the *process is very active,* and common where the ulcer is cicatrizing. Even in the latter condition it may not be constant. *Abdominal examination* usually reveals an *area of tenderness a little above and to the right of the navel.* Pinching the skin over the epigastrium frequently locates, by tenderness of a certain skin segment, with marked accuracy, whether or not the lesion is in the stomach, the pylorus, or the duodenum ("Mackenzie's sign.") In cases of pyloric ulcer, the tender spot is usually just above the navel. *Hemorrhage* is serious and may manifest itself as hematemesis or melena. It is rarely the most constant symptom. It may manifest itself by periodic dark stools, with more or less faintness on the part of the patient, and a coincident anemia. In some cases the hemorrhage is sudden and pronounced. Moynihan regards duodenal hemorrhage as more serious than bleeding from gastric ulcerations, because in the latter instance the bleeding points are accessible to treatment. Duodenal hemorrhage is more apt to recur than is gastric hemorrhage. In it larger vessels are in danger of being ruptured than is the case in the stomach. In gastric ulcer, the hematemesis is generally a criterion of the extent of the hemorrhage; in ulcer of the duodenum the bleeding may go on for days before showing in the stools. The patient may die from hemorrhage before any considerable quantity of blood has appeared in the discharges. The intestines in these cases are filled with more or less altered blood.

About five and one-half per cent of Moynihan's cases were associated with gall-stones. The differential diagnosis may be impossible. In duodenal ulcer the area of tenderness is rarely so high or so well-localized as in gall-stones. *Perforation* may occur at any stage of duodenal ulceration. Sudden perforation is usually accompanied by sharp, agonizing pain, followed by symptoms of shock and by peritonitis.

Ulcers may sometimes heal spontaneously. There is always a greater or less degree of contraction of the scars. This may lead to a most pronounced condition of *gastric dilatation,* with retention. If adhesions, from inflammatory reaction, do not form to adjacent viscera a certain degree of *gastroptosis* is usually found.

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MEDICOLEGAL.

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THE PHYSICIAN'S LEGAL LIABILITY FOR THE ACTION OF NURSES.

This was the subject brought before the Supreme Court of Louisiana for decision recently. The defendant, a medical man, was the proprietor of a sanitarium. Plaintiff had been admitted to the sanitarium as a patient under the care of his regular medical attendant. The physician prescribed a mild solution of alcohol to be applied by one of the nurses of the sanitarium. The nurse negligently applied pure alcohol and the patient claimed that by this negligence he lost his sight. It was held that the defendant was liable for the negligent act of his nurse. The Court said: "The proprietor of a drug store has been held liable for the mistakes of his clerk. The general responsibility of a druggist and his clerk are greater than are the duties of a nurse. Nevertheless, the duties of a nurse are sufficiently important to render her and her employers liable for inflicting pain negligently. The nurse was employed by the sanitarium and had charge of the patient's case in accordance with his contract of employment. She was acting for the sanitarium under the direction of plaintiff's physician. Her duty was to carry out the orders of this physician, and it was the duty of the sanitarium to see that she carried out the orders devolving upon her as nurse. The physician could have had another nurse called in her place but he had no right to discharge her. The management of the sanitarium had the right of control and of discharge. We think the patient should recover something for the intense suffering, though momentary, which the mistake occasioned."

This question often arises where a patient goes to a hospital recommended by a physician and is injured by the nurses of that hospital. In such cases it has been expressly held that the doctor is not responsible. A case occurred in Massachusetts, Baker versus Wentworth, in which the physician brought action for his fees and a counter claim was brought by the patient for damages. At the trial it was shown that patient had applied to the doctor for treatment and he had advised her to go to a certain hospital and have an operation performed. It appeared that the patient was injured through negligence of the nurses in the hospital. The doctor offered to show that he was not the proprietor of the hospital, which testimony was admitted, for the defendant could not be held accountable for the negligence of nurses unless he held some relationship to the hospital. The same decision has been reached by the English courts. Where a physician regularly employs a nurse and keeps her at his office to assist him in treating his patients a different rule would undoubtedly apply and he would be responsible for the failure to exercise due care. Where a physician conducts a private hospital or sanitarium and expressly or impliedly agrees to furnish nurses to the patients in this hospital he would be subject to the usual rule of liability applied to private hospitals in general. Various conditions may come up. The nurse may be engaged and paid by the patient without the physician having any voice in the matter, or the patient may request the physician to recommend a nurse and engage her services, or the physician may employ and pay the nurse himself. Only in the last instance would he be liable for negligence, but in the other the nurse stands rather in the position of fellow-servant to the patient.

Cincinnati, Grand and Nassau.

EDITORIAL COMMENT.

THE FIGHT REGARDING INSURANCE EXAMINATION FEES.

Tillotson says that "God requires no man's service upon hard and unreasonable terms." If this policy is vogue with Creator, valid reason is not apparent why different practice should obtain with corporation. However apathetic the medical profession may have seemed heretofore regarding compensation for life insurance examinations, recent developments have demonstrated that decisive and organized effort on the part of medical societies has brought about the reëstablishment of the five-dollar fee for this service.

The determined stand taken by the medical profession, particularly in Kentucky, is undoubtedly responsible for the recent action of the Mutual and Equitable insurance companies of New York in returning to the former full examination fee of five dollars,—irrespective of the amount of life insurance desired,—notwithstanding Medical Director Symonds of the former company announces that "This has been rendered possible by rigid economy in other directions whereby a saving in the expense of obtaining new business has been effected of sufficient size to warrant this step."

The refusal of medical examiners throughout the country to become party to the contracts which the companies submitted during the past year certainly must have exercised a demoralizing effect on the medical departments of these corporations, since equally capable physicians could not be induced to accept the declined fee, and the fear of losing prestige with the people is undoubtedly the paramount reason for acquiescing in the demand for five dollars. The raise is a judicious move on the part of the companies, for, while they will be obliged to meet the increased fee, intelligent medical opinion as to the fitness of candidates will be invaluable and will in the course of time not only place money in the coffers of the companies but will incite confidence in the minds of the people.

Many companies lowered fees on the ostensible plea that their financial status would not permit the former rate. Economy is indeed a commendable thing, but capable physicians balk at having their professional resources looted to augment the dividends of these already octopodan enterprises. Other companies arranged a graded scale whereby the fee would be in accord with the amount of insurance subscribed, but inasmuch as the labor involved in examining an applicant for a thousand-dollar policy is as great as that involved in making an examination for a ten-thousand-dollar policy the physician again was obliged to bear the brunt of the condition. Medical science has made vast strides within the past quarter century, and within the past decade diagnostics has seemingly reached perfection. So exact has this branch become that physicians no longer flounder in the nebulous sea of uncertainty, the employment of modern methods of precision, largely disregarded in the requirements for examining insurance applicants, rendering possible the determination of practically definite conditions. Since medical examination is considered essential presumably the object is to approximate true physical status, and therefore instead of reducing the fee to three dollars it should be augmented to twenty-five dollars and the examination amplified accordingly, even to include cell and differential blood counts and gastroenterologic analyses.

Fifteen companies are now paying the five-dollar fee and all other companies will probably authorize their medical staffs to announce accedence to this requirement. The companies already in line are: Ætna Life Insurance Company, Hartford, Connecticut; Boston Mutual Life Insurance Company, Boston, Massachusetts; Citizens' Life Insurance Company, Louisville, Kentucky; Commonwealth Life Insurance Company, Louisville, Kentucky; Connecticut Mutual Life Insurance Company, Hartford; Equitable Life Insurance Company, New York City; Manhattan Life Insurance Company, New York City; Massachusetts Mutual Life Insurance Company, Springfield; Mutual Benefit Life Insurance Company, Newark, New Jersey; Mutual Life Insurance Company, New York City; National Life Insurance Company, Montpelier, Vermont; New England Mutual Life Insurance Company, Boston, Massachusetts; Northwestern Life Insurance Company, Milwaukee, Wisconsin; Pacific Mutual Life Insurance Company of Caliorfnia, Los Angeles; Providence Life and Trust Company, Philadelphia, Pennsylvania.

This is one of the greatest victories ever achieved by the medical profession of America. Victory is one reward of organized effort, but there are other considerations, among them compensation, and in the language of Chaucer, "Take reward of thine own value." Retain the privilege of determining the fee for professional service.

MOVEMENT FOR A MEDICAL BUILDING IN DETROIT.

For several years past the various medical associations of Detroit have been meeting in the offices of their members; in hotel parlors; in lodge and court rooms, and in a word, have been wandering about from place to place like "a man without a country."

The rapid growth of Detroit, with attendant increase in the number of physicians practicing in the city, has demonstrated, in the most emphatic manner, the need of a permanent home for the profession of the city. Detroit, with a population of 400,000, and supporting nearly one thousand medical practitioners, a county medical society with a membership of 400, and several smaller medical societies, has practically no facilities for medical research work. The public library for a while endeavored to supply the void, but owing to lack of funds for the purpose, inaccessibility of the medical department, and lack of interest on the part of the profession because of the paucity of the literature supplied and the unintelligent selection of books, its efforts were in a measure futile. Detroit is the only large medical center which has not a more or less complete medical library, and the time has come when the profession must provide a permanent repository for medical literature, a permanent meeting place for the various medical societies, and a center from which good, earnest, and profitable work for the profession at large may emanate.

Realizing the great need of a permanent home for the medical profession of the city, a few members of the Wayne County Medical Society met, this spring, and informally discussed the matter. They reported at the meeting of the society, called for that purpose in May, and after considerable discussion it was decided to take the matter up officially and a committee of seven has been appointed to formulate plans for providing ways and means to establish a permanent home for the society. This committee consists of Doctors Ernest L. Shurly, Chairman; Louis J. Hirschman; Howard W. Longyear; Leartus Connor; Angus McLean; Ernest W. Haas and Emil Amberg, and is to report in the fall. L. J. H.

ANNOTATIONS.

A MOVEMENT TO REVISE MEDICAL NOMENCLATURE.

Medical nomenclature, which has long been the butt of criticism from physicians and philologists, is at last to be revised and rendered more in harmony with the ancient tongues from which it originated. The technical terms of medical onomatology are derived largely from the Greek and logically to the Hellenics should be accorded the honor of revision. Regretting the gross misuse to which the language has been subjected, the Medical Society of Athens has lately inaugurated the movement, and inasmuch as the committee in charge is composed not only of learned men, but largely of Greeks by extraction, the new nomenclature will doubtless be comparatively free from misnomers. Of the thirty-four members comprising the committee, thirty are natives of Greece, two reside in Constantinople, one in Cairo, and one in New York City—Doctor Achilles Rose. Besides these men, a professor of philology will render assistance in interpretation of the language. The reform is a welcome one, and if properly conducted will doubtless receive the approbation of the entire medical world.

THE MATERIAL AND SPIRITUAL MAN.

The duality of man, a profound and rather interesting subject, received the attention of Doctor Giles C. Savage, of Nashville, at the Atlantic City meeting of the American Medical Association. According to this writer, life is a mystic union of spirit and matter, a union which has not yet been comprehended and perhaps never will be.

Neither is it understood wherein the spirit of man differs from the spirit of the brute. Since human intelligence is of higher order than that of the animal, so is the human spirit more exalted in character. The nature of the spirit the author was unable to state; nor was he able to define matter beyond the mere chemical and physical properties. However, he ventured the opinion that the spirit of the animal is unable to control or prolong life, whereas the spirit of man can assist the organs to fight disease and delay impending death. On the other hand the spirit of man in some moods may weaken the material organism and hasten dissolution.

MEDICAL NEWS.

THE PASSING OF A DISTINGUISHED PHYSICIAN.

SIR JOSEPH FAYRER, Honorable Physician (Military), and Physician Extraordinary to King Edward, died recently at Falmouth, England, whither he had been sent a decade ago by Sir Edward Sieveking in the hope that he might recover from a disease of the respiratory system. His essays regarding the effect of the climate on his health, contributed much to the knowledge of climatologists. Sir Joseph was a retired army surgeon and rendered service in India, where he not only held a high official position but likewise occupied himself in studying the deadly snake poisons of Hindustan, on which he was an authority, and in studying tropical diseases. The high court position which he held rendered him the recipient of many foreign honors. He was a Doctor of Philosophy of Padua; a foreign associate of the Academy of Medicine of France; a foreign corresponding member of the Royal Academy of Science of Lisbon; an honorary member of the Academy of Medicine of Rome, and a fellow of the Academy of Sciences and College of Physicians of Philadelphia.

MINOR INTELLIGENCE.

ACCORDING to report Baltimore is in a sorry plight as regards tuberculosis. Between five and six thousand cases are prevalent in the Maryland metropolis.

RUMOR says that Professor H. His, a son of the anatomist, will succeed Professor von Leyden in the chair of special pathology and therapeutics at Berlin University.

DOCTOR THOMAS D. COLEMAN, of Atlanta, Georgia, was elected to the Presidency of the American Climatological Association at the recent meeting in Washington, District of Columbia.

ARRANGEMENTS are being made by a committee recently appointed to found a prize in memory of the late Doctor Paul Julius Mobius, of Liepzig, the well known writer on neurologic diseases.

THE University of Pennsylvania has established a Psychologic Clinic in connection with its department of psychology. Already marked results have been attained in the treatment of backward children.

FIFTY thousand dollars will be expended by the Fabiola Hospital, of Oakland, California, in the erection of a new surgical building. This is the first of a series of buildings to be erected on the State University plan.

COLUMBUS, OHIO, has a fresh air camp for consumptives under the supervision of the Society for the Prevention and Cure of Tuberculosis. Twenty-eight patients of both sexes and various races are at present under treatment.

IN consideration of the elevated standards of living and the increased cost of food and other staples, Vienna physicians have decided upon the adoption of a fee bill which contemplates a raise of fifty per cent over previous charges.

MEDICAL women of Lincoln, Nebraska, have organized a medical club with a membership of twelve. At a recent election Doctor Laura Brown was elevated to the presidency and Doctor Mabel Dunn to the secretary-treasurership.

FORTY thousand dollars has been collected by the French Geographical Society to be utilized in the study of sleeping sickness in French Congo. Brazzeville will be the center of operations, the laboratory being located at that place.

THE German Government has lately rescinded a measure prohibiting the utilization of rubber containing antimony in vessels intended for use as food receptacles. Late observation seems to demonstrate that the mixture is not deleterious to health.

"POSTOPERATIVE Phlebitis, Thrombosis and Embolism" was the subject of the paper which was accorded the Alvarenga Prize of the College of Physicians and Surgeons of Philadelphia for 1907. The author is Doctor William Louis Chapman, of Providence, Rhode Island.

SLEEPING sickness is responsible for a reign of terror in Africa. Report says that the epidemic has progressed to such alarming degree that its advent in a family is the signal for relatives to despatch the victim to the streets, and it is not uncommon to see dead and dying along the roadsides.

COLUMBUS, OHIO, has been chosen as the next meeting place of the Mississippi Valley Medical Association, October 8, 9 and 10, 1907, being the dates. Doctor George F. Butler, of Chicago, will be the orator in Medicine, and Doctor F. D. Smythe, of Memphis, will deliver the oration in Surgery.

The fourth annual meeting of the National Association for the Study and Prevention of Tuberculosis, which met recently in Washington, will be held in that city during September, 1908. More than $100,000 will be expended in preparation therefor.

The American Proctologic Society augmented its membership by the acquisition of the following physicians at its recent Atlantic City meeting: Doctors James A. MacMillan and James A. McVeigh, of Detroit, and Jerome M. Lynch, of New York City.

Plans have just been completed for a new hospital building to be erected at Alvarado, near Orange, California. The structure will be four stories high and of fire-proof construction throughout, the exterior being of pressed brick and terra cotta. The estimated cost is sixty thousand dollars.

The signature of Governor Hughes has recently been affixed to a bill passed by the New York legislature prohibiting the use of unclean and unsanitary milk cans. The authorities are empowered to confiscate any cans of this nature hereafter found. Two milk-can inspectors were appointed for the city of New York.

Henceforth incumbents of the chairs of anatomy, histology, chemistry, physics, and pharmacology of the Paris Faculty of Medicine must devote their entire attention to the respective branches, thus preventing acceptance of positions as physicians or surgeons in hospitals or engagement in general practice.

The deaths of Doctor Theodore von Jürgensen, professor of medicine and head of the Medical Polyclinic at Tübingen, at the age of sixty-seven years, and of Doctor Max Schueller, director of the Surgical Department of the Polyclinic of the Association of Domestic Hygiene, at Berlin, at the age of sixty-four, are announced.

Official report from the twenty-one German universities shows a total registration of 7,219 medical students for the winter course of 1906. This is a rather high total, as in the winter and summer terms of 1905 and 1906 the enrollment was respectively 6,080 and 6,570. There are 104 female students pursuing medical work in Germany.

At the end of the summer session of 1907, Professor A. Politzer, who for forty-six years has delivered lectures at the University of Vienna, and functionated as head of the Vienna Ear Clinic, will tender his resignation. The professor has arrived at the age beyond which, according to the Austrian laws, he may not retain his professorship.

Mrs. Margaret McMahan, who was reported to be the heaviest person in the state of New Jersey, died recently at the age of forty-eight years. Her weight exceeded five hundred pounds, and it was necessary to enlarge the door space in order to remove the specially constructed coffin to the hearse. Twelve men capacitated as pallbearers.

BECAUSE of the vigorous and determined protests lately inaugurated by the medical profession of the country, the Equitable and Mutual Life Insurance Companies, of New York City, have elevated their examination fees to the old standard of five dollars. It is to be hoped that physicians will demand like fee from the other old line companies of the country.

WORK of reconstruction has been inaugurated at McGill, the ruined walls being now almost entirely removed. The insurance on the burned buildings approximates $325,000, and since a sum of $500,000 is required to execute the work contemplated in the plans, philanthropic friends of the university will be afforded an opportunity to manifest their liberality.

AUSTRALIA has adopted an opium bill which, according to a contemporary, has accomplished much toward restraining the drug evil on the island. In the city of Melbourne especially good results have been achieved. The police reports seem to indicate that the various obstacles placed in the path of opium indulgence will eventually effect complete suppression of the habit.

THAT the career of so eminent a man as Professor Albert von Mosetig-Moorhof, of Russia, should terminate in the deplorable manner reported is sad in the extreme. While suffering from a recent attack of mental depression he threw himself into the Danube and was drowned. The doctor was a noted surgeon and introduced the use of iodoform in that branch of practice.

THE commission recently appointed by the New York legislature to investigate the condition of the blind, the causes predisposing to blindness, and methods by which, as far as possible, the condition may be prevented, has entered upon its duties. The secretary of the commission is Doctor O. H. Burritt, of Batavia, New York, and any assistance and advice from the medical profession will be gratefully received by this official.

THE Austrian Congress for the Protection of Children met this year at Vienna. Considerable discussion was indulged in regarding the subject of racial degeneration, which was almost unanimously attributed to the use of alcohol and to child labor. As a consequence of facts disclosed at the meeting a bill has been introduced into Parliament to control liquor indulgence among the poorer classes and to regulate child labor.

TENNESSEE has a new law which compels proprietors of stores and establishments, where people are accustomed to congregate, to provide a sufficient number of cuspidors for their use. A minimum fine of ten dollars or a maximum fine of one hundred dollars may be imposed upon persons failing to comply with the law. Likewise persons who are detected in the act of expectorating in public places are liable to a fine not to exceed five dollars.

The authorities of Berlin have instituted war against moving-picture theatres, of which there are over two hundred in the city. The health department holds that the jumping movement of the film is injurious to the eyesight, and since the shows are patronized to a great extent by children, disastrous results may be foreseen. Perhaps the authorities are not cognizant of the immoral effect some of the films are bound to exert upon persons of immature age.

Boston has a suburban day camp for consumptives at Mattapan, where over one hundred forty persons are now being attended, and over twenty are on the waiting list. Most of the victims are residents of the slum districts of Boston, South and East Boston and Chelsea, and in spite of the distance of their respective homes from the camp opportunity for treatment is eagerly sought.

The official opening of the new Harlem Hospital occurred recently. The building is a magnificent structure, five stories high, and represents an expenditure of $624,000. The institution possesses a vacant plot of ground adjoining its present site on One Hundred Thirty-Sixth Street, and a nurses' home will shortly be erected thereon. Plans for this edifice require accommodations for eighty nurses.

Statistics seem to prove that scarlet fever has been unusually active in the British metropolis during the past year, over twenty-one thousand cases having been treated in London hospitals. The large number of cases treated, however, may be ascribed to the fact that more scarlet fever patients than ever before took advantage of hospital facilities. In 1890 only forty-two per cent of persons afflicted with the disease sought hospital treatment, while in 1906 eighty-eight per cent were admitted.

The following officers were elected at the recent Atlantic City meeting of the American Proctologic Society: President, Doctor A. Bennett Cooke, of Nashville, Tennessee; vicepresident, Doctor Louis J. Krouse, of Cincinnati; secretary-treasurer, Doctor Lewis H. Adler, Jr., of Philadelphia; executive council—Doctors J. Rawson Pennington, of Chicago, Samuel G. Gant, of New York City, A. Bennett Cooke, of Nashville, and Lewis H. Adler, Jr., of Philadelphia. The next meeting of the society will be held at Chicago in 1908, the time to be announced later.

According to the *Tidsshrift for Kemi og Farmaci,* the oldest medical document in the ancient Norse language is the *Icelandic Pharmacopeia,* published in the thirteenth century. It now forms part of a collection of antique manuscripts in the Royal Library of Copenhagen. The work consists of five octavo pages and was intended as a guide to the people in times of sickness and accident. Needless to say the methods of treatment were primitive in the extreme. The remedies were derived mostly from the vegetable kingdom, although a few were taken from the animal and mineral.

Sir William Tennant Gairdner, a distinguished physician of Edinburgh, died recently at the age of eighty-three years. He took his medical degree in 1845, while still under twenty-one, and was immediately appointed resident physician to the Royal Infirmary. At thirty-eight he was professor of medicine at Glasgow, and subsequently devoted forty years to medical practice. He numbered among his friends and coworkers such men as Lister, Ramsey, and Caird, and his death removes another of the old school which did so much toward elevating the standard of medicine in Britain.

RECENT LITERATURE.

REVIEWS.

SUTTON'S TUMORS.*

The first edition of "Sutton's Tumors" established itself as an authority on neoplasms and has been one of the most frequently quoted books on the subject. Its classification was not altogether a good one, and was based upon clinical characteristics rather than pathologic. As a book of reference it has fallen far behind the times, and the attempt to make a new edition that would be up to date is not wholly successful, inasmuch as the greater part of the old material has been retained. Fifty new illustrations and one hundred pages have been added, but the book is devoid of mention of much of the recent suggestive work accomplished in the study of malignant tumors.

*Tumors (innocent and malignant), their clinical characters and appropriate treatment. By J. Bland-Sutton, F. R. C. S., Senior Surgeon to the Chelsea Hospital for Women; Surgeon to, and Member of the Cancer Investigation Committee of the Middlesex Hospital. One volume, 8vo, 670 pages, 355 illustrations. Price, cloth, $5.00 net. W. T. Keener & Company, Chicago.

EYE, EAR, NOSE AND THROAT.*

This is one volume of a series of ten on the year's progress in medicine and surgery. The present volume, edited by Doctors Wood, Andrews, and Head, reviews the progress in their respective lines. While the work is in no sense complete it contains much of value to the general practitioner, as well as to one doing special work. The book is well arranged for ready reference and the numerous illustrations add to the value of the work. W. S. A.

*Practical Medicine Series, Volume III, 1906. The Year Book Publishers, Chicago.

GENITOURINARY DISEASES AND SYPHILIS.*

Its revision, especially on prostatic hypertrophy, commends it over the former edition. Because of its brevity it is applicable to those beginning the study of genitourinary diseases. I. D. L.

*By Henry H. Morton, M. D., Clinical Professor of Genitourinary Diseases in the Long Island College Hospital; Genitourinary Surgeon to the Long Island and Kings County Hospitals, and the Polhemus Memorial Clinic. Illustrated with 158 half-tone- and photoengravings and 7 full-page colored plates. Second edition, revised and enlarged. Royal octavo, 500 pages. Bound in extra cloth. Price, $4.00, net. F. A. Davis Company, publishers, 1914-16 Cherry street, Philadelphia.

A TREATISE ON THE PRINCIPLES AND PRACTICE OF MEDICINE.*

Books on internal medicine are proportionately interesting in so far as they reflect the individuality of their writers. Classifications can vary little; history, pathology, diagnosis and prognosis are facts of common possession. The chief opportunity for evidence of ability must largely manifest itself in the description of the symptoms of disease and in suggestions for the alleviation thereof. It is also essential that an author secure a proper balance between different factors in disease, and that the various ailments are given due relative prominence. Doctor Edwards has written a very valuable book. It is a work that smacks of the busy days of active duty amongst many ill people. While being intensely practical, it exhibits at the same time a scholarly and scientific appreciation of disease.

The general arrangement of the work is much similar to other standard texts on medicine. Authorities are freely quoted and statistics furnished when deemed necessary. A helpful feature is found in the numerous tables for differential diagnosis which are scattered throughout the book. Especially good are those on diseases of the liver, the gall-ducts, the kidneys, chronic valvular diseases, malaria, aphasia, and cerebral hemorrhage, thrombosis and embolism. Much attention is directed towards therapy. General directions are entered into minutely and a great number of prescriptions are printed. Herein lies one of the features which may bring forth criticism. Some of the formulæ are very complex and not altogether in accord with modern ideas of the definite therapeutic efficiency of a few drugs exhibited in active dosage. It does not appear quite necessary to suggest a combination of as many as six preparations in acute enteritis (page 651), seven for simple gastritis (page 599), five for whooping-cough (page 187), five for constipation and anemia (page 689). Other instances might be cited. Therapeutic judgment is occasionally to be questioned. The continued administration of the digitalis, iron, arsenic and phosphorus combination in cardiac disease associated with anemia, suggested on page 428, might lead to serious consequences in the hands of the general practitioner, whose patients are not always under his direct care. It is rather questionable whether or not, in cases of cardiac palpitation, "a belladonna plaster or a few drops of the fluid extract" greatly helps the patient "by anesthetizing the peripheral fibres of the vagus," as suggested on page 453. It is not necessary to burden the reader with other examples. Nonmedicinal therapeutic procedures are generally well described. Criticism might be called for in a few instances. For example, it has never appeared wise to us to *suddenly* introduce large aspirating needles in cases of pleuritic effusions, as directed on page 561. Needles introduced slowly are certainly introduced more safely, and frequently furnish valuable information to their manipulator. Bending of the spine, with consequent narrowing of the interspaces, does not necessarily follow slow introduction of needles, nor is it less liable in rapid work. It might also be mentioned in connection with pleurisy with effusion, that the correct explanation of "Grocco's sign" is not furnished by the author.

The general excellence of the work, however, far outweighs the errors contained in it. Certain discussions call for special comment. The chapters on pericarditis, pleurisy, diseases of the liver and gall-ducts, diseases of the blood, constitutional diseases, cerebral hemorrhage, meningitis, and tabes dorsalis are particularly well written.

The book is well printed, and its illustrations are a great help in supplementing the text. The plates, in colors, particularly those under pericarditis with effusion, tuberculosis, malaria, and diseases of the blood are worthy of note. The blood fields shown are the best that we have seen reproduced in some time. Errors in proof reading creep in with considerable frequency, especially in the chapter on typhoid fever, but we presume that this will be remedied in the next edition of the work. The quoting of many authorities in the text sometimes makes the reading less smooth, especially where the names of four to a half dozen authorities are grouped in support of a not always vital point. It would seem that these references could be better placed at the bottoms of the pages or at the ends of chapters.

Comparing the work of Doctor Edwards with other texts on medicine, we think that while it does not excel several that we might name, it is quite as valuable as the majority. It contains considerable new material, and will doubtless remain a standard text. It surely deserves a place on one's bookshelves. F. S.

*By Arthur R. Edwards, M. D., Professor of the Principles and Practice of Medicine and Clinical Medicine in Northwestern University Medical School, Chicago. Octavo, 1328 pages, with 101 illustrations and 19 full-page plates in colors and monochrome. Cloth, $5.50 net; leather, $6.50 net. Lea Brothers & Company, Publishers, Philadelphia.

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ORIGINAL ARTICLES.

MEMOIRS.

PARACENTESIS OF THE PERICARDIUM.

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THE pericardium is comparatively rarely the seat of operative exploration and treatment. This fact contrasts strongly with the conditions in the neighboring cavities of the pleuræ and peritoneum, and seems strange in view of the difficult diagnosis and the fatal tendency in many cases of pericardial disease. The relative neglect depends chiefly upon three things: (1) The fact that pericarditis is often not suspected and therefore is not searched for by measures that must include some operation. (2) There is a fear, not unfounded, of the danger of pericardial operations. (3) An incomplete knowledge of the value of a bolder course.

In view of these conditions it is worth while, from time to time, to get new bearings and to learn what the prospects are.

I shall not speak in detail of the diagnosis of pericarditis. It is often easy, especially in "dry" cases, and in cases observed from the beginning in diseases prone to that complication. There are many useful signs, but no infallible ones. Careful application of all will sometimes serve to make a diagnosis when less complete examination would utterly fail, but in some cases an exact diagnosis is impossible without direct exploration of the pericardial cavity.

Even if the general diagnosis of pericarditis be possible, the exact character of the process cannot be made out except by direct examination of the contents of the pericardial sac. Not alone the precise etiologic variety, but the distinction of serous, purulent and hemorrhagic forms is as impossible now by clinical signs as it was in the days of Laennec. There may be abundant pus, with virulent bacteria, without fever or other obvious symptom, as I have seen myself.

Since not only the requirements of exact diagnosis, but also those of treatment demand that these peculiarities be taken into account, the need of pericardial exploration receives additional emphasis.

"Where there is pus, evacuate it," is an old and well-tried maxim. But in the pericardium even nonpurulent exudates are recognized as serious sources of danger, by setting up chronic irritation, adding to the denseness of adhesions, and either from the latter, or from indurative processes in the heart-muscle, leading to heart-failure.

On the other hand, operative removal of pericardial exudates is not always necessary. In many cases absorption occurs, either spontaneously or under treatment directed to that end. So we see it in rheumatic cases, treated with ice-bags over the heart, with or without salicylates. Still more vigorous measures to promote absorption have their advocates, though even the most popular of these, blisters, often fail. Disappointment in the use of such methods depends not less upon differences in mode of application than upon peculiarities of the disease, but time should not be lost in trials of blisters or other absorbents unless a distinct effect is quickly shown.

As indications for operative intervention on the pericardium, we have:—

The need of a definite general diagnosis.

Diagnosis of the character and if possible cause of the exudate.

Removal of the exudate.

It is hardly necessary to mention the vital indication for immediate operation, caused by very large exudates, such as marked cyanosis and dyspnea, weak, frequent and irregular pulse.

These indications are generally admitted to be valid; the difficulties begin with the details of the selection of place and method of operation. The place to operate depends upon the position of the exudate and the heart with relation to neighboring structures. The blood-vessels in the chest wall—the internal mammary being the most important,—the liver and diaphragm demand consideration in various manipulations, but do not require special discussion now. The position of the heart and the relation of the sac to the pleuræ are more important.

It has long been supposed, following Skoda, that the heart sinks back in pericardial exudates, leaving the front and sides covered with liquid. We owe to Schaposchnikoff, confirmed by Rehn, A. Fraenkel, Brentano, Doebert, and several others, the knowledge that this is not always so, but that the heart, even without adhesions and in large exudates—one and a half liters in a case observed by Heiking,—swims or floats on the liquid, close to the chest wall. This explains why the friction rub and the apex beat can be perceived after the exudate forms. This position is effected chiefly by the elasticity of the great vessels. Schaposchnikoff thought that inflammation of the walls of the vessels would permit the heart to sink, but this does not seem certain, since the straightening out of the vessels in systole would not be hindered by inflammatory softening. After death the conditions are different, and the heart may sink down, if there is room for it, but enlargement of the heart is certainly not essential to the anterior position in life. Adhesions can of course also fix the heart in contact with the chest wall. Another old view, that the heart occupies a position in the upper part of the pericardium, and turned towards the left has been borne out by several recent observers.

The anterior position of the heart explains why puncture in the middle of the pericardium, the site often chosen because it is most certain to be uncovered by the pleura, has often been wholly negative or has led to puncture of the heart itself. The latter accident has been rather frequently noted, and with very different results. Often there is no bad effect. In fact, in some cases the effect seems rather beneficial than otherwise, but although formal aspiration has been suggested as a remedy for dilatation of the right ventricle it has few advocates. In several reported cases accidental puncture of the heart has been fatal within a few minutes or longer, up to one or two hours. The difference in time doubtless depends upon the cause of death. In sudden cases nervous inhibition seems necessary to assume. In slower cases death is probably due to hemorrhage from a tear of the right auricle, with "tamponade" of the heart. This is not likely to happen from injury to a ventricle.

The lateral parts of the pericardium are not always free from danger in operating. Usually, as most observers have remarked, the pericardium spreads out and becomes broader at the base than the heart. This not only promises safety in operating, but also forms the basis of two important diagnostic features—Rotch's sign, or the alteration of the cardiohepatic angle (Ebstein) on the right side, and the extension of the sac, and with it the line of dulness, beyond the apex on the left. Unfortunately both these areas are likely to be sources of diagnostic error and of operative difficulty, if not danger. The cardiohepatic angle may resemble that described by Rotch, without exudate, in fat subjects, or in case of dilatation of the heart (Ewart). Erben reports a case in which Rotch's sign was due to hernial protrusion of the pericardium. Or there may be exudate without alteration of the percussion lines at that point. On the left side, adhesions may prevent the pericardium from extending beyond the apex beat, or the latter may be impossible to see or feel, or to locate by auscultation. The dulness may be due to pleurisy or pneumonia.

Another source of difficulty may lie in the fact that the pleura on both sides may be adherent along the normal lines, in front of the distended pericardium. Empyema may follow accidental wounding of the pleura, an event that is less serious than might appear at first, because pleurisy and empyema so freqeuntly follow pericarditis—in twenty-one out of twenty-eight cases observed by Still, according to Rudolf and Peters.

Röntgen-ray examinations, with the skiagraph or fluoroscope, often give important information in pericarditis with exudate, but owing to the limitations of the method they do not furnish infallible directions for operations.

In short, operations on the pericardium are never free from danger. They are justified by the possibility of more serious danger that exists in many cases.

The methods of operating, both diagnostic and therapeutic, vary considerably, partly on account of the exigencies of cases, partly on account of the judgment and experience of the operator. Since pericarditis may require an emergency operation, and because cases almost always come under the observation of the physician or general practitioner in the first place, it is desirable that the technical details be clearly understood. If physicians would look for pericarditis in acute diseases in which it is likely to occur as constantly as they do now for pleurisy, and if they acted upon the suspicion as is now being done for empyema, a small but important set of cases would make better recoveries than they do now, and some very difficult cases of heart disease would be prevented.

The simplest method of operating is puncture by an aspirator—the successor of the trocar recommended by Senac. Notwithstanding the imperfections and limitations of aspiration, it has been of undoubted value in pericarditis. It can often be used when a better operation would not be permitted. It suffices in many cases for diagnosis, and in some for treatment. If it were used more frequently, and its revelations made more familiar to physicians and patients, more thorough operations would be easier to secure, as has happened in regard to peritonitis and pleurisy.

Aspiration of the pericardium can be done with any suitable instrument. The hypodermic needle is often recommended, but it is usually too short and of too fine caliber to be useful. The needle should be not less than one millimeter in outside diameter and five centimeters long, and attached to an efficient syringe, such as the glass antitoxin syringe. The flat trocar and canula of Curschmann is doubtless useful. The operation must be done with aseptic precautions. The needle should be introduced slowly, as in all exploratory aspirations, so as to enable the operator to feel the tissues. In that way the uncomfortable (Bäumler) feeling of the heart scratching against the needle can sometimes be recognized in time to prevent tearing the muscle or a coronary vein, or penetrating one of the cavities. The sites for aspiration must be selected with careful reference to the results of physical examination, assisted if possible by *x*-rays. Blind puncture should never be practised about the pericardium. Many successful punctures have been made in the upper part of the area, in the third and fourth interspaces in either side. I do not like them on account of the inferior drainage, and on account of the greater risk, on the right side especially, of injuring the auricle. A lower point on the right, as the fifth interspace in a case with Rotch's sign well marked, is safer. If the apex beat can be distinguished inside the line of dulness, and especially if dulness is increased below the apex, the fifth or sixth interspace on the left, inside the line of dulness, is to be recommended. As Romberg points out, the danger of infecting the pleura is not to be considered. In fact the pleura can be aspirated on withdrawing the canula from the pericardium.

But the best place for aspirating in case of extensive exudates, and perhaps even in small ones, is the lower part of the pericardium, entering from the left costoxiphoid space. This point is preferred by Shattuck, Fitz and Osler, and it is becoming more and more favored for radical operations, as I shall point out again.

If puncture is negative in the location first chosen, it should be repeated with a change of position of the patient, and if still negative in another place. In many cases puncture is negative in one place, positive in another; or negative with the patient recumbent, positive when sitting up or leaning forward.

When found, the fluid should be removed as completely as possible. Sometimes removal of a small quantity for examination has seemed to stimulate absorption, as we see in pleurisy, but as there, too, complete or repeated aspiration is often necessary. A case of Döbert's is instructive in connection with some of the statements just made. At intervals of four days he obtained 130, 1050 and 200 cubic centimeters of fluid; still later, 500. In another case he withdrew 12 cubic centimeters on the right side; later, 400 cubic centimeters on the left side, none on the right while lying down, but 300 cubic centimeters on raising the patient.

The immediate effect of successful paracentesis of the pericardium is often very striking, especially in cases with marked pressure symptoms. The curative value is much less, as the fluid is likely to recur. The finding of considerable exudates soon after tapping has been explained by some as an agonal or postmortem phenomenon, but this is not probable. On the contrary, there is a growing conviction of the imperfection of such operations. Partly from this, partly from the danger of working in the dark in so important a locality, more radical operations on the pericardium are being more frequently advocated. They are not, however, sufficiently common to be appreciated as they deserve.

The bistoury and lancet were sometimes used to puncture the pericardium, but the operation came in time to be an incision, and even this became modified. Removal of the bony or cartilaginous thorax was proposed early, but until recently most operations were made through the interspaces. These had certain inconveniences, such as limited room, and certain dangers, such as injuries of vessels, and as these became more clearly understood, more formal operations, that is, resections of costal cartilages, were practised. The fifth interspace near the sternum was most frequently selected for incision, or if resections were to be made the fourth or fifth left costal cartilages, or both of these, were removed or recommended for removal. Removal of part of the sternum as a preliminary to opening the pericardium is probably an old idea. It is said that Riolan the younger suggested trepanning that bone, but there are some contradictions in the references, and I have not been able to see the original. It is possible Riolan suggested two routes, trepanning the sternum and incision in the costoxiphoid space. If so, he was just about in the position now occupied by many surgeons. Very recently, J. H. Bacon has advised trephining the sternum opposite the fifth interspace as anatomically most correct, and giving easy access to the pericardium with the best drainage.

This method, however, shares with many others the disadvantage of making the opening, at least in many cases, over the heart, and that organ is likely to prevent drainage by pushing up against the opening. A much more promising site is that proposed by Larrey, as the result of clinical observation in a case of stab wound of the epigastrium, penetrating the pericardium. It was recommended by J. B. Roberts as long ago as 1880, but actual interest was first given to the matter by Ogle and Allingham, twenty years later. Since then, Allingham has reported additional operations, and has been followed by Pendlebury, Mintz, Jaboulay, Berard and Pehu. Roberts feared that the situation would not give sufficient room, an objection that has been made by more recent writers, but clearly shown to be erroneous by Allingham. If the costoxiphoid space is narrow, as it often is in adults but rarely in children, it is easy to resect part of the seventh cartilage, as in Mintz' operation, or, if desired, the sixth. Porter objects to the epigastric operation on account of the risk of wounding the pleura or diaphragm. But none of the positions above the sixth rib are free from the danger of meeting the pleura, for it sometimes extends under the sternum. In any position care must be taken, and the operator must realize the anatomic and technical details.

The latter I shall not try to include, but I shall mention only some of the points that will occur to anyone who finds it necessary to recommend or undertake the operation.

Any of the pericardial operations may be done under local anesthesia, with the usual limitations of that method. I do not find anyone who confirms a point mentioned by Doctor Percy Kidd,—that the pericardium is very sensitive. It was not in a case I had opened in the fifth interspace, but as there was great thickening, that may have altered the sensibility of the membrane, which could be anesthetized if necessary.

The cavity should be cleared of all exudates by the finger, swab, or probe. Drainage tubes sometimes cause irritation and irregular action of the heart, but in many cases they have been in as long as needed, usually only a few days, without any inconvenience. The operations do not last long, fifteen or twenty minutes in many cases; the wounds heal quickly and the late results are generally favorable in proportion to the timeliness of the intervention.

It is still almost as true as when Trousseau remarked to Doctor Clifford Allbutt, that "Operations on the pericardium have never had a fair chance," but with increasing care in diagnosis, and greater confidence in results of operations, such operations should increase in number and importance.

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ARCHES OF THE ARTERIA ILEOCOLICA.

(PRELIMINARY NOTE.)

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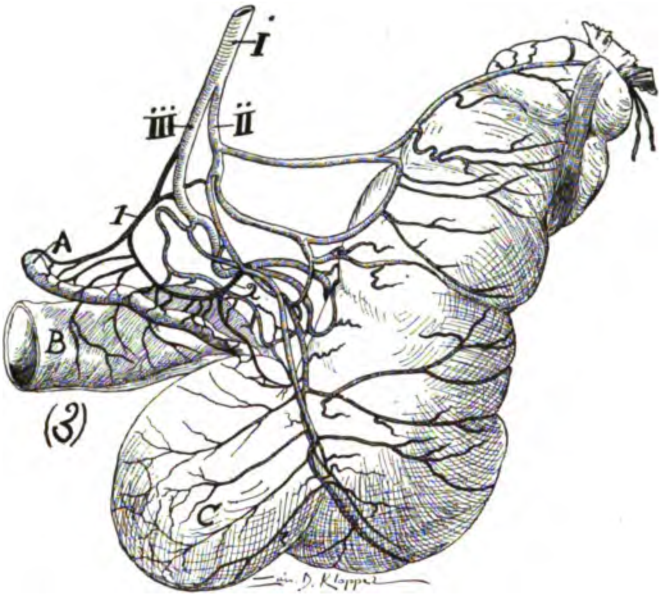
DURING the past five months I have injected and dissected the arteria mesenterica proximal (superior) in exactly forty subjects for the purpose of exposing and illustrating the vascular supply of the appendix. During the detailed dissection of the arteria mesenterica proximal an observation occurred to me which I had not previously noted, nor can I find reference to it in any anatomic text-book. I searched the current anatomic text-books from the first great systematic work on Anatomy published (in 1791) by Samuel Thomas Soemmering (1755-1830) to the present time, but no special suggestion of the arches of the ileocolica artery was noted. It is not strange that anatomists should have neglected any special or detailed observation of structures in the ileocolic angle, for it is only a generation since surgery bloomed or became specialized in the ileocolic region.

As a generalization it may be stated that surgery is the father of anatomy. For example, in 1868 Doctor Joseph Hyrtl, professor of anatomy in Vienna, discovered that the dorsal and ventral renal vascular blades did not anastomose at their periphery though their peripheries were in actual contact. However, Hyrtl did not realize the vast signification of his wonderful and practical discovery because



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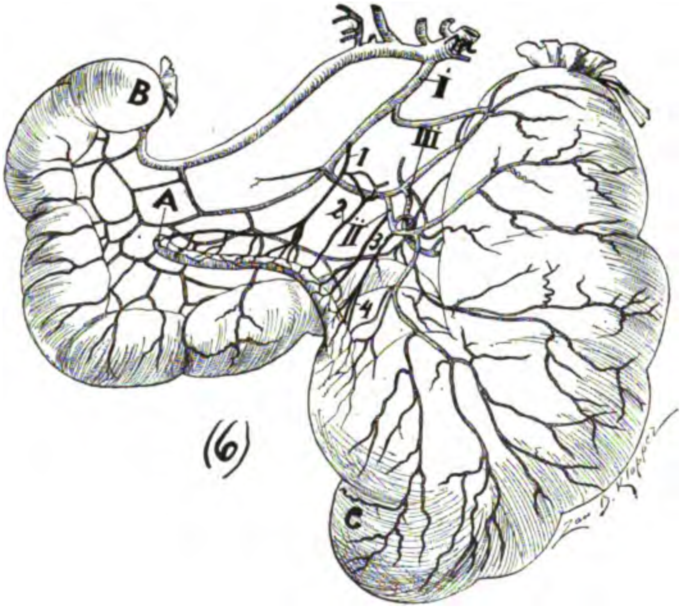

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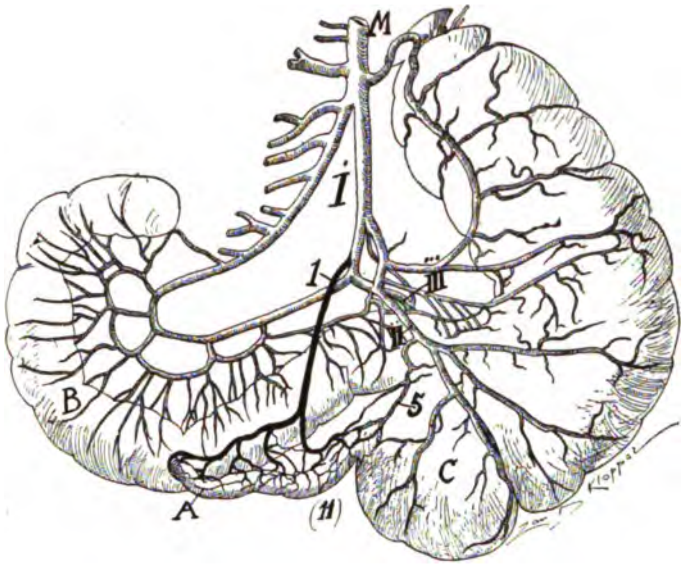
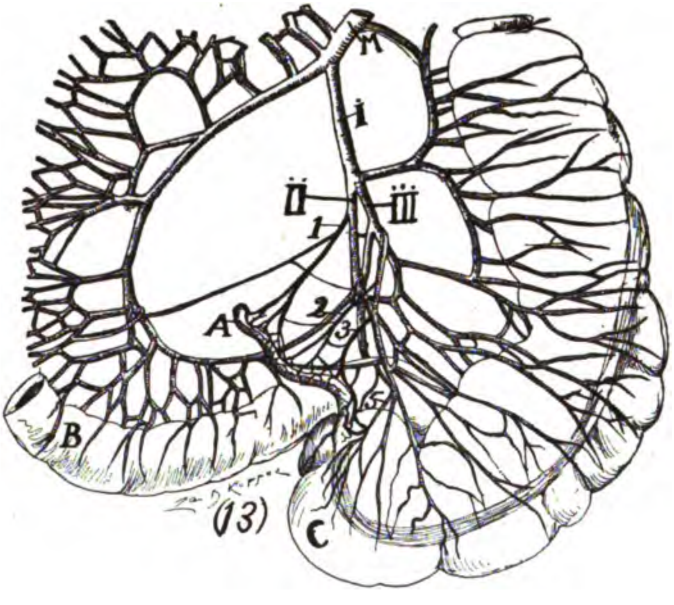
renal surgery was yet unborn. Nevertheless, Hyrtl was witty and capable of sufficient innuendo to note that his discovery maintained him

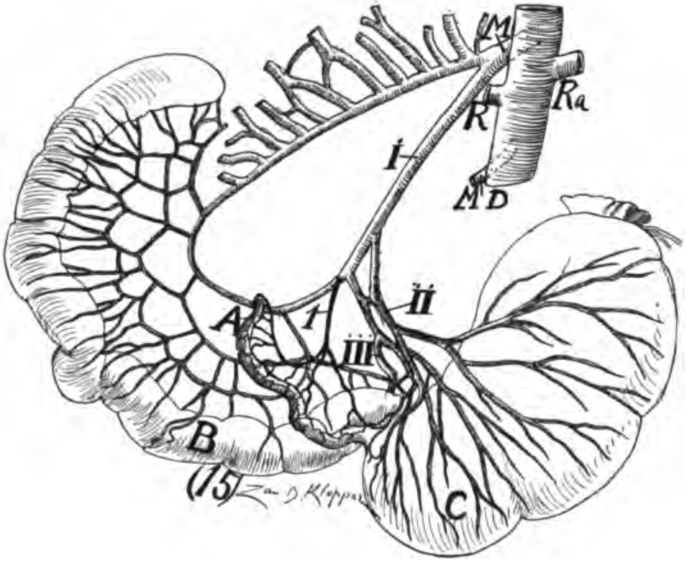


in active business, furnishing corrosion specimens of circulation of the kidney for European museums. Half a dozen years ago, by the aid of



corrosion anatomy I solved the same problem as Hyrtl. However, on perceiving by reference to the literature that Hyrtl had discovered it over a score of years previously I at once eponymized it "Hyrtl's exsanguinated renal zone" (see DaCosta's edition of Gray's Anatomy, 1905, page 1423). As a surgeon I saw directly that Hyrtl's exsanguinated renal zone was invaluable and that it was the elective line of cortical renal incision with minimum hemorrhage. Hence in renal incision surgery is the father of renal anatomy. Again, since the blooming of appendectomy surgery became the father of appendicular anatomy. When physicians discover that an organ is subject to definite disease which can be remedied by incisions, surgery becomes the father of its applied anatomy.

As regards the arches of the ileocolic artery, I dissected ten subjects before I realized the peculiar anatomic whorl or knot of arterial arches located in the ileocolic angle. Whether the detailed exposition and description of the special ileocolic vascular arches will be of any utility to medical science remains to be proved, as is the case with all progressive views. It appears to me that the ileocolic vascular arches are a primodial vascular landmark, a remnant of some ancient, vast anatomic structure and function in the appendix. At present the arches of the ileocolic artery are in a state of atrophy, irregular, angular. The arches are so modified in position, dimension and relations by the evolutionary process in the appendix that at present the appendicular artery does not always originate from them.



TOPOGRAPHY OF THE ARCHES OF THE ILEOCOLIC ARTERY.

Form of the ileocolic vascular arches are irregular, acutely angular, elongated (see figures III, VI, XI, XIII, XV).

Dimension of the ileocolic vascular arches are relatively limited for the excessive diameter of the enclosing arteries.

Position of the ileocolic vascular arches is in general located an inch proximalward and an inch medialward from the ileocolic angle.

Number of arches of the ileocolic artery average five.

Relation of the arches of the ileocolic artery is distinctly with the cecum.

Utility of the vascular arches of the ileocolic artery is to furnish a maximum continuous blood supply to the cecum (and primordially to the appendix—an ancient stomach).

Percentage of subjects possessing marked, prominent, ileocolic vascular arches is seventy per cent.

NOTE ON THE ILLUSTRATIONS.

The illustrations were all produced similarly, namely: (a) Removal of the arteria mesenterica proximal from its origin with attached viscera at autopsy; (b) Injection of the artery with red lead and starch under persistent, vigorous but uniform pressure; (c) Dissection of the entire artery; (d) The colon, cecum, appendix and ileum were distended with air and sketched as a model by the artist, Zan D. Klopper. The relation of the ileocolic arches to the colon, cecum, ileum, and appendix, the form and dimension of the arches are changing factors during the contraction and distention of the colon, cecum, ileum, and appendix. The illustration signs are practically similar for each figure, hence, a single notation will suffice: M, Arteria mesenterica proximal (superior); I, Arteria ileocolica; II, Arteria ileocecalis dorsalis; III, Arteria ileocecalis ventralis; A, Appendix; B, Ileum; C, Cecum; 1, 2, 3, 4, Arteria appendicularis (in black); 5, Arteria cecalis which anastomoses with the arteria appendicularis.

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ANENT THE METHODS OF SURGICAL PRACTICE IN VOGUE SEVENTY-FIVE YEARS AGO.

JOHN SISTAIRE CAULKINS, M. D.

It has ever been my custom and delight to rummage among old books to see if anything of interest or value could be discovered in these tattered remnants of the past. Examining the stock of a Detroit dealer in such recently, an old book was met with, bought for five cents, and read. Being found to contain a passage of interest to a medical circle, and being written in Italian, the writer of this paper, having some acquaintance with the romance languages, thought he would translate the passage into English and read it here, if opportunity offered in a lull of more important matters. The extract is an account of a surgical operation done at the Spielburg Prison, Austria, in the year 1828, seventy-five years ago. It was an amputation of the leg, to get rid of a tumor on the knee—nature of tumor not stated—presumably not cancerous, as the patient survived the operation many years.

Silvio Pellico, the author of the book in question, was an Italian scholar and poet who lived in the first half of the past century—born in 1788 and died in 1854. His rank was high among the learned men of his age; he was a great friend and admirer of Byron, the English poet, having translated some of his works, the tragedy of Manfred for one, into the Italian. His own works are numerous, mostly tragedies, among which the one telling the sorrowful story of Francesca Da Rimini* is the best known. In the "Universal Bibliothek" (Reclam), a German collection of more than four thousand titles of the best literature of all countries, it is the only one named. So in the "Bibliotheque Nationale," a similar French collection. It is apparent from this, that the high claims made by his countrymen for Silvio Pellico, as a poet (he being called by a contemporary the leading dramatist of modern Italy, a title accorded by most critics to Vittorio Alfieri), have not generally been admitted, but if the world has done him an injustice by underrating his poetry, it has made ample amends in the notice which it has taken of this little prose work from which we are about to read, "Le Prigioni"—"My Prisons"—which has been translated into every European language that has any pretense to a literature.

The book is the story of the ten years' imprisonment of its author for Carbonarism, by the Austrian tyrants under whose sway Italy was left after the fall of the first Bonaparte. The Carbonari were a secret society of Italian patriots whose object was a revolution that would free Italy from the odious tyranny under which she groaned. The society was well organized with grips, signs, and passwords, to avoid detection, and spread with great rapidity among the Italian youth; but there are always traitors and spies. Before plans had sufficiently matured the Austrian government took the alarm and the prisons were soon full of those suspected of Carbonarism. Silvio Pellico was among the suspects. The paper he edited was seized, he himself was arrested and kept in prison in Venice, and other placės, two years and a-half while the government was collecting evidence against him, after which he was tried, convicted, and sentenced to be hung.* Great efforts were made to save him from this extreme penalty, which was finally changed (perhaps through priestly influence more than any other, for he was a pious Catholic) into fifteen years' carciere duro—equivalent to our term solitary confinement, with the addition of a chain around the ankles. He was pardoned after serving ten years of the term. The time preliminary to his trial was spent mostly in the prison so celebrated in the annals of the Venetian republic—the Piombi, in English the Leads, so called from its leaden roof. Afterwards he was sent to the Spielburg, which is a prison and formerly was a fortress near Brünn, in Moravia, a province in the north of Austria, where he remained till he was pardoned.

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*Those who have dipped into the pages of the Divina Commedia will remember that in his progress through the Inferno, guided by the Roman poet, Virgil, Dante saw her and her lover undergoing their fearful doom for their mutual crime and heard from Francesca's own lips the story of their fall, after the telling of which, the lovers gave a wail of such hopeless woe that the poet fell down in a swoon.

† The phenomenal success of the book is not due to its value as monumental literature. It is a nondescript performance. It is not a diary, several years elapsing without noting a thing; it is not history, no account of current events being given of what happened—not even of his own trial; it is not in the least scientific, as showing the effects of imprisonment on the human intellect or suggesting how they can be avoided or overcome. The book is merely the record of a few occurrences (mostly previous to the trial of the author) told in such a taking style that whoever begins to read it will finish it. It is this word-picturing style that accounts for its wide circulation. The author is a master of that, worthy to rank with John Bunyan, Dean Swift, or Goldsmith. In the preface to the French edition, the writer, who was the cell-mate of Pellico, tells how they preserved their intellects from the prison decay. They had regular review days, one for each branch of science and literature, each being in turn catechist and catechumen.

Several of his best works were written during his imprisonment. A pencil and a few sheets of paper were allowed him, by his captors, which had to be rigorously accounted for. These he used as far as they would go, reading them over several times before they were taken away, then writing on the top of his little table, and when that was full, after reading it carefully over and over, scraping it clean with a piece of glass, ready to write on again.

*It is plainly to be seen by every reader of Silvio's book that the evidence on which he was convicted after two and one-half years of imprisonment was obtained in the most infamous way possible. He was a bachelor yet, when arrested, having lost, a few years before, an amiable and lovely girl to whom he was about to be married. Although his great sorrow had kept him single, Silvio had a very inflammable heart, and another weakness, an inordinate love for strong coffee, which seems to have had a very peculiar effect on him, he himself calling it a mild intoxication that helped him bear his discomforts of hunger, heat, and mosquito bites. These two weaknesses were a good foundation on which to build a cunning scheme to get the needed clues for his conviction. After he was put under the Leads in Venice, the keeper's daughter, Zanze, was set to the double office of carrying him his coffee and flirting with him. The coffee was sometimes bad enough and sometimes good; when it was good Zanze claimed the credit of making it; when it was bad she charged it to her mother. In this way she soon won his gratitude that before a great while deepened into dead-earnest love.

On page 63 of his book, speaking of the coffee, Silvio says: "When she brought it and said 'I made this myself,' I always found it excellent; but if she said 'the mamma made this,' it was just hot water." Their intimacy ripened so fast that in a short time Zanze grew bold enough to throw her arms about Silvio's neck and cry out over some trouble of her own of which she had been telling him. The second time she tried this scheme, Silvio, who seems to have been a modern edition of Joseph bound in one volume with Saint Anthony, was obliged to speak plainly to her and request her not to do that any more, saying "It does not look well." Italiano: "ció non va bene,"—it does not go well. There was among the Secundini a class of lower officials who had the care of the prisoners and their cells, one Tremerello, who had been Silvio's attendant before Zanze was installed, and was secretly a friend to him. He, Tremerello, saw through the treacherous scheme and gave the victim warning not to say too much to the girl, for she was a spy on him, but he might as well have said nothing. Silvio was too far gone to pay any heed to it, nor was he inclined to believe later, when it had become apparent that the girl was no better than she should be, the reports that were brought to him after her visits ceased and Tremerello was in charge again. He calls the stories (see page 74) calumnies and lies.

It is a wonder he survived his ten years' imprisonment, being of very feeble constitution, asthmatic from childhood. His account of his sufferings for the want of good air to breathe in the subterranean cells of the Spielburg and under the Leads at Venice, where the air in summer was like an oven and swarmed with mosquitoes, is painful reading. However, he came through ten years of it alive and so did a friend of his, Piero Maroncelli, who was arrested, a few days before he was, for the same thing, that is, on suspicion of being a Carbonaro. The two young men had been very intimate friends, and events conspired to make the intimacy lasting. They were together under the Leads in Venice while the Austrian government was collecting evidence against them; were tried, convicted, and sentenced together, both to the death penalty, which was commuted to "carciere duro"—fifteen years for Pellico, and twenty for Maroncelli in the subterranean cells of the Spielburg rock. For a short time, there, each had his own cell, but the sickly Pellico soon broke entirely down, under the hardships of prison life, and Maroncelli, a much tougher man, was detailed to nurse him. After Silvio recovered somewhat they were allowed to be permanent room-mates. Four years later their relations to one another changed: Maroncelli broke down and Silvio was his nurse.

This preliminary history brings us down to the time of the incident described by Silvio in the eighty-seventh and eighty-eighth chapters of his book,—the amputation of the leg of his room-mate, Maroncelli, to get rid of a tumor on the knee. Below follows the translation of the same as nearly literal as the idioms of the two languages will allow:

* * *

Soon after the departure of Solera and Fortini,* poor Maroncelli had a tumor come on his left knee. At first, the pain in it was not very severe but made him limp some. Afterwards the weight of the chains began to hurt so that he could seldom take the daily promenade. One morning in autumn he wished to go with me to breathe a little fresh air: there was snow on the ground, and in a fatal moment while I was not holding him firmly he stumbled and fell. The shock made the pain in the knee acute immediately. We carried him to his bed and he could not get up again. When the doctor came to see him he finally decided to take off his irons.

The tumor grew worse from day to day, became enormous, and always more painful. The sufferings of the poor fellow were such that he could neither rest in bed nor out of bed. When for any reason he had to be moved or raised up, I had to take hold of the leg with the greatest care and gently move it in the necessary direction, and even that would sometimes bring on spasms that would last a quarter of an hour. Bleedings, showerings, caustic stone,† fomentations, dry and wet, all were tried by the doctor. The only effect they had was to make the pain worse. After the burnings with the stones,* suppuration set in. That tumor became an open sore but did not diminish in size, nor did the discharge from it give any alleviation to the pain.

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*Two Carbonari prisoners that had served their time.

†What is caustic stone? The next sentence seems to indicate actual cautery with a red-hot stone.

Maroncelli was a thousand times worse off than I, and no one can imagine how I suffered with him. It was sweet to me to do for him all I could, because it was done for such a worthy friend. But to see him lie there wasting away under such protracted atrocious torments and not to be able to do more for him; and to say to myself "That knee never can get well—it will surely kill him;" and then to see his wonderful courage and serenity. Ah, that wrung my heart in a way I cannot describe.

In this deplorable state he still wrote poetry, sung and conversed on all subjects as usual. This he did on my account, trying to hide a part of his sufferings from me that I might the better keep up my own courage. He finally got so bad that he could take no nourishment or sleep; he emaciated frightfully, and often had fainting spells, but for my sake he always tried to collect his vital forces and remain master of himself. What he suffered for nine long months is indescribable. Something had to be done, and it was finally determined to have a consultation. The protomedico came, approved of what the doctor had tried, and without giving his opinion on the case, or saying what should be done next, went away. A few moments later the underintendent came and said to Maroncelli:

"The protomedico did not venture to explain himself here in your presence, fearing it might have a bad effect on you to hear the naked truth too suddenly. I assured him you did not lack for courage."

"I hope," said Maroncelli, "I have given some proof of this in suffering all these pains without howling. Did he propose to have something more done for me?"

S.—Si, signore, the amputation. But seeing you so emaciated, the protomedico hesitates to advise it for fear you have not the strength to endure the shock of the operation. Do you wish to run the risk?

M.—Of dying? Am I not going to all the same if my leg is left where it is?

S.—Then we will send a statement of the facts to Vienna and the permit to amputate will soon come.

M.—What? Is a permit needed?

S.—Si, signore.

Eight days afterwards the expected permission arrived. The sick man was carried into a larger room, and he requested that I might stay with him. "I can breathe better," said he, "in the arms of my friend." His request was granted—my company conceded to him. The Abbot Warba, our confessor, came to administer the sacraments to the poor fellow. This act of religion over, we waited for the surgeons and said nothing. Maroncelli sung a hymn while we waited.

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*A more careful examination of the text shows that the word translated stone above is plural. There was a set of something called caustic stones commonly used in the surgery of that period. Burning is plural, too, showing that they were used more than once. A probable conjecture is that they were sharp-pointed, conical stones, used as a clumsy substitute for the knife in opening a tumor. As the Italian does not make its plurals in the letter s, like the English, French and Spanish, but by a simple change in the terminal vowel, a mistake in number is comparatively easy to make on first glance.

* * *

Finally the surgeons came. There were two. One was the ordinary of the house, that is, our barber, and he, when operations occurred, had the right to do them with his own hand, and would never forego his privilege and let some one else have the credit. The other was a young surgeon from the Vienna school, already enjoying a reputation for much ability. Having been sent by the governor to assist at the operation and direct it, he would have preferred to do the cutting himself, but was obliged to be contented with watching the performance of it by the old barber surgeon.*

*We will not speak too slightingly of the barber surgeons. The father of modern surgery, Ambroise Paré, was a barber surgeon, was licensed as such in 1536, and got a position in the French army of Marshal Mont Jean, which went to Italy to support the claims of Francis I of France to the Duchy of Milan. Paré must have been very young at the time. The year of his birth not being accurately known, his exact age cannot be told, but he was probably about twenty. It seems incredible that so young a man should have been selected for such great responsiblities, and the fact shows how scarce surgeons were in that age of the world.

The improvements which Paré made in surgical methods began as soon as the army reached the seat of war, and by the time its remains got back to France, he was a famous man. His new way of treating gunshot wounds and amputations was soon in use everywhere, these being his greatest reformations in surgery.

Gunpowder had been used in warfare for one hundred years or more at that time, first in artillery and for perhaps sixty years in a hand firearm. Up to Paré's time it was universally believed that a gunshot wound was a poisoned wound and must be treated with the cautery, boiling hot oil being the cauterizing agent generally employed. Paré, not seeing any reasonable grounds for the old belief that gunshot wounds were poisoned, had the courage to disregard it and save his patients the torture from the boiling oil.

His other great reform in surgery was of still more importance to the human race. It was the use of the ligature in amputations. Before his time it had been the cautery that was used to stop the gush of blood from the severed arteries, either by thrusting the hot iron into their open calibre, or clogging them with flax saturated with boiling pitch. Boiling pitch had the preference.

It is not claimed that Paré invented the use of the ligature. It had been suggested before his time, but such suggestions were considered visionary. Boiling pitch had the experience of ages behind it to dictate its use and warn the innovator not to stray off from known ways into untrodden paths. The responsibility was too great. No man of common, ordinary courage would dare to abandon a method of procedure that had come down from the hoariest antiquity and adopt an untried one, knowing that if the new plan failed he would draw censure and probably ruin on himself.

There is evidence extant to show that arteries were tied by the Greek and Roman surgeons as long ago as Galen's time, and even before that, but this knowledge had been lost in the dark ages which followed the breaking up of the Roman Empire by the northern barbarians. Paré had somehow heard a rumor of this but could not have read it, for it would be in some book or manuscript written in Latin, of which language he did not know a word. Like many of the greatest geniuses and benefactors of the human race he was illiterate.

The patient was seated on the edge of the bed, the leg down. I held him between my arms. Above the knee, where the thigh began to be sound, they tied a string for a guide to the circle that the knife must make. The old surgeon cut all around by the string about an inch deep, then he drew back the cut part and cut again through the skinned muscles. The blood gushed in torrents from the arteries, but these were soon tied with threads of silk. Lastly he sawed off the bone.

Maroncelli never groaned during the operation. When he saw them carry away the cut-off leg he gave a pitiful sort of look and then said to the old surgeon: "You have liberated me from a deadly enemy and I have nothing with which to recompense you." There was a rose in a cup on the window. He said to me: "Please to give me that rose." I gave it to him and he offered it to the old surgeon, saying to him: "I have nothing else to present to you in token of my gratitude." The surgeon took the rose and shed some tears.

The surgeons had brought nothing with them except their irons,* supposing that the hospital of the Spielburg prison would be provided with everything else wanted, but the operation over, it was found that different necessary things were lacking, such as cerates, ice, and bandages. The poor mutilated fellow had to wait two hours till these

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Printing had not long been in use at that time (there had been a printing office in Paris about sixty years). Books were scarce and dear, only to be found in libraries for the use of the rich, and Paré was very poor. When he came to publish his discoveries to the world he was obliged to write in the rude French spoken at his time. He was blamed for this in the bitterest way by the pedants and fogies of the day, it being held by them that science was degraded if not written about in the formal Latin.

Paré was the idol of the soldiers in that army and the armies of the three French kings after Francis I. It was under the third of these, Charles IX, that the massacre of Saint Bartholemew occurred. Although Paré was a Huguenot he was not slaughtered with the rest of the sect, the king having sent for him the evening before and locked him in his own bedroom. It was the esteem which the king had for his surgical skill that saved him. It has been the lot of few that have lived on this earth to be so nearly idolized and almost worshiped as was this man.

Before closing this notice of the father of modern surgery, we must not forget to mention his famous reply when complimented by an admirer on his cure of the Duke of Guise. This general was so badly mangled at the battle of Bourgogne that he was carried from the field for dead, but showing some signs of life had been cared for by Paré in his most careful and sensible style, and in spite of all predictions to the contrary, got well of his supposed fatal hurts. His face, however, was so badly puckered from the cicatrices on it, that he no longer looked like himself, and for the rest of his life was called M. le Balafré, that is to say, Mr. Scars. The reply made to his friend by Paré was this: "Je l'ai pensé—Dieu le a gueri." English: I dressed his wound—Dieu cured him. These words are carved on the base of Paré's statue made by the celebrated sculptor, David d'Angers, who helped so many French celebrities into their marble clothes.

This utterance shows that Paré was a clear thinker and had rediscovered the great truth known to the ancients, but forgotten during the dark ages, that all cures are the work of the Vis medicatrix Naturæ, and that the province of the surgeon is merely to clear away the impediments to its work. Paré's words show how far he was in advance of his age, at which time surgery was obscured by a mass of absurd and superstitious notions like that of the famous sympathetic powder, which, if applied to the weapon that caused the hurt, would surely cure if only the wound was properly cared for.

*Knives and saws.

could be brought from the city. At last he could be laid down on his bed and the ice put to the stump. The next day they cleaned up the stump from the clot of blood which had formed, drew down the skin, and bandaged.

For several days they gave the patient nothing except half a cup of broth, with the yelk of an egg beaten up in it. After the danger from surgical fever was past, they began to feed him more nutritious food.

The Emperor gave orders that he should, till his strength was reestablished, be fed good food from the kitchen of the superintendent. The cure took forty days. After that we were sent back to our prison.

(Here ends the translation).

* * *

Among several things that strike us as queer and strange in the above narrative, the strangest is the fact that the man lived it through. It must have been a great tax on the vitality left in the emaciated body, to sit for two hours on the edge of the bed waiting for the ice to come from Brünn before he could lie down. The use of ice being to promote clotting and stop the loss of blood from the cut capillaries and other small vessels, why did not the operator lay the patient on his back, elevate the stump, and apply absorbed compresses to it?

It is to be noted that no mention of a tourniquet is made. It is possible, but not probable, that one was used, but not mentioned by our author in his description of the operation. Having been so precise as to notice the string around the thigh for a guide to the knife, he would not be apt to omit so important a step as the application of the torniquet. Besides he says plainly that the surgeons brought nothing with them but their irons. Notice, too, that he says the torrent of blood from the arteries did not stop till they were tied with a thread of silk. It is quite evident that this amputation was done without a tourniquet.

Incredible as this may seem, it is no more so than the fact, shown by the context, that the ancient guild of barber surgeons, long extinct in other parts of civilized Europe, was still alive and flourishing in Austria, and in lively competition with the professionals from the Vienna school. The barber surgeons had their legal rights in their antiquated ways of doing things and were not at all minded to give them up and make room for the regular surgeons with their newfangled ways. No doubt the young surgeon from the Vienna school, who was sent by the Governor of Moravia to supervise the operation, had a tourniquet in his amputating case, and could have made a flap operation by its aid, but the old barber not being disposed to give up his rights, the young man was obliged to content himself by looking on, while the older man did the job in the old way by the circular operation, the only way ever known to barber surgeons.

The fact that only seventy-five years ago the surgical care of several hundred people was left in the charge of an uneducated hair-dresser, who had learned all he knew during his seven years' apprenticeship to the barber's chair, shows how far behind more civilized nations Austria (or its government) was in the sentiments of philanthropy, humanity, and regard for human life. Anything was good enough for prisoners.

We are not to be surprised that no mention is made of the use of ether or chloroform. It was before their day. Sir James Y. Simpson was not born till 1815, and Morton did not give the man with the aching tooth the ether till fifteen years later.

What surprises us as much as anything is the lack of preparation for the job, which was begun without the necessities at hand to finish it. Since ice was considered so essential, why did not the old barber ascertain if there was any to be had nearer than the city of Brünn, and have it on hand to use when he wanted it?

It seems that no stitches were used on the stump. Our author says: "The next day they cleaned the stump of the clot of blood which had formed, washed it, drew down the skin and bandaged." No mention of stitches. What held it from retracting?

Among the things sent for were cerates. These were likely some kind of adhesive plasters which hindered retraction.

Two years later Pellico and his friend were pardoned and set at liberty. He never again meddled with political matters. His ten years of prison life had taken all the fight out of him.

The rest of his life, twenty-four years, was spent in Italy, but he never did anything more for the cause of Italian liberty. The case was different with Maroncelli! He fled from Italy as fast as he could, preferring the life of a refugee in a foreign country to remaining in his own under the espionage of the suspicious Austrian government.

"Le Mie Prigioni," written ten years after the author's liberation, gave no offence, but a French translation of it, which soon appeared did. The preface to this was written by Maroncelli at the request of Latour, the French translator, on account of his having been a fellow sufferer in the ten years' imprisonment. There were some remarks made in this preface not exactly calculated to please the court of Vienna and very different from the tone used by Silvio himself. Whoever reads his book through will notice how very careful he is not to say anything that sounds like blaming his captors, however badly they used him, as for instance, when in a severe fit of sickness they refused to let his chains be taken off. He never complained but accepted everything as the Lord's will in the most pious and penitent spirit. He was visited by an agent from Vienna to enquire if he endorsed the publication of the criticism made by Maroncelli. He was not, however, molested as he explained to the emissary that he was not responsible for what Maroncelli did, and that he deprecated the publication he had made.

He lived after this, about fourteen years, a very quiet life devoted to literary pursuits and music, in the family of a lady of great rank and wealth—the Duchess of Barolo—as her secretary and librarian.

Thornville, Michigan.

TRANSACTIONS.

AMERICAN PROCTOLOGIC SOCIETY.

NINTH ANNUAL MEETING, ATLANTIC CITY, NEW JERSEY, JUNE 3 AND 4, 1907.

THE PRESIDENT, SAMUEL G. GANT, M. D., IN THE CHAIR.
REPORTED BY LEWIS H. ADLER, JR., M. D., SECRETARY.

READING OF PAPERS.

PRESIDENT'S ADDRESS.

THE President, Doctor Samuel G. Gant, of New York City, said that the annual meetings of the society were like a post-graduate school, where advanced information in proctology could be obtained by the members. He considered it unwise to admit to membership in the society the general surgeon and young rectal specialists of less than five years' experience in this special work, because the membership would become too large and the papers contributed by them would not meet the requirements. He maintained that the proctologist of the future, in order to be successful, must have a thorough literary and medical education, a hospital training and clinical facilities, and that he must be clever, industrious and persistent. He emphasized the necessity of educating both the profession and the laity as to the remarkably improved methods now employed in the handling of patients suffering from disease in the lower bowels. He also said it was the duty of the proctologist to demonstrate by his work and writing that most tubercular fistulæ were curable, and that the curing of ordinary fistulæ did not tend to bring about lung or skin affections as was formerly believed; that fecal incontinence does not follow fistula operations, when the muscle is cut at a right angle and the wound is properly dressed; that many rectal diseases, such as fissures, ulcers, small fistulæ and some hemorrhoids can be operated upon under local anesthesia; and that in the majority of instances, constipation and chronic diarrhea are curable by local and surgical measures. Finally, he emphasized the fact that the etiology of many discomforts, nervous and reflex phenomena, usually attributed to the genital organs, is frequently to be found in some pathologic process located in the sigmoid rectum or anus.

PROCTOLOGIC LITERATURE.

DOCTOR SAMUEL T. EARLE, of Baltimore, read his report on proctologic literature, covering a period from June, 1906, to June, 1907, in which he said that while there has been nothing startling in proctologic literature in the past twelve months, your committee is gratified with the steady progress in this branch of medicine and surgery, as has been reflected in the literature on this subject. Especially gratifying have been the recommendations for the radical treatment of carcinoma of the upper rectum and sigmoid, as set forth in the papers of Samuel G. Gant, William J. and Charles H. Mayo, and James P. Tuttle, in which they all recount the combined advantages of the abdominal and perineal routes, which we think will greatly lessen the likelihood of recurrences and increase the number of permanent cures. We note with pleasure the systematic efforts that are being made in the study of the etiology of pruritus ani. The paper of Wallace, of London, in 1905, on the study of this question, stimulated the efforts of others in this direction, and we find an excellent paper by J. C. Hill, of Boston, on the same, in the *Boston Medical and Surgical Journal,* 1906. In this article, he takes the stand with Wallace that there is always a cause for this malady in which the pruritus is only a local symptom. We quote him as follows:

"Pruritus ani is the symptom caused by unnatural moisture or discharges, produced either by lesions about the anus or by congestion, or some pathologic condition in the rectum or sigmoid. It is due to one of five causes. First, and by far the most important, are superficial ulcerations, or abrasions of the anal canal. Second, catarrhal diseases. Third, external hemorrhoids. Fourth, inflammation or irritation of the crypts of Morgagni. The free borders or valves of these crypts consist chiefly of nerve fibers, ganglion cells and connective tissue. When inflamed or infected, they may give rise reflexly to pruritus ani. The writer calls attention to the tits which project from the margin of these valves as accessory sense organs. When hypertrophied or elongated they cause many distressing symptoms about the anus, namely, creeping, crawling sensations and itching. Fifth, small polypi of the anal canal."

It is not only necessary to remove the exciting cause of the disease, but also to direct appropriate treatment to the unnatural conditions of the skin. In this connection your committee is glad to be able to report a number of cases of the aggravated form of this disease, which had failed to respond to the usual local and constitutional methods that were successfully treated by Doctor Ball's' recommendation of dividing the anal nerves. These have been reported by Doctors Martin and Earle.

Doctor Charles B. Kelsey calls attention to the office treatment of hemorrhoids by puncture with the electric cautery. The method is to make numerous punctures with a pointed cautery to the internal hemorrhoids. This method has been used for the past ten years in lieu of that by injection, with most satisfactory results, and without any unfavorable effect. For the details of the method, I would refer to his article in the *Therapeutic Gazette* for March 15, 1906. The reviewer would respectfully report with reference to this suggestion, that about ten years ago he tried in a number of cases, but with only temporary success where the hemorrhoids were large. It answered very well in small capillary hemorrhoids.

J. A. Hartwell, in the *Annals of Surgery,* Philadelphia, for 1906, Volume XLIII, page 146, reports a case of resection of the rectum for syphilitic stricture, with end to end anastomosis. As might have been predicted, it recurred, and while it was necessary to continue dilating, he was not hopeful of results. Your committee would remind its members that such radical measures seldom accomplish the desired results, as recurrence is almost inevitable.

ADDITIONAL EXPERIENCE WITH A NEW PROCEDURE IN OPERATING FOR ANORECTAL-FISTULA.

Doctor J. Rawson Pennington, of Chicago, in discussing this subject, said he had found that the employment of the seton in operating on cases of anorectal fistula greatly aids in preserving the contour of the anus and the functions of the sphincter muscles.

The technique in using the seton is as follows: After all of the fistulous tracts external to the sphincter are divided, a probe-pointed director is passed into the bowel through the remaining tract and an incision made on its distal side. This incision should extend far enough distally to divide all or a part of the fibers of the external sphincter and in such a direction as to locate the transferred internal opening at or near the anal margin. Then, turning the knife, make an incision—Salmon's "back cut"—on the proximal side of the tract. A seton is then passed through the opening entering the bowel and tied loosely around the tissues remaining and undivided.

The wound is dressed as after the ordinary incision operation for fistula. At the end of twenty-four to thirty-six hours the wound is redressed, care being taken to dress it so that the opening entering the bowel will be made to heal from the proximal toward the distal side. The object in doing this is to advance the final fistulous tract as far distally (toward the skin) as the case will permit, so that, if possible, it will pass through or distally to the fibers of the external sphincter, when the healing process is complete.

As a rule the enlarged tract entering the bowel soon closes, with the exception of the part through which the seton passes. As soon as this has occurred the seton may be removed, and by the time the external wound is healed the tract entering the bowel will possibly have closed also. Should it not, at any time later this little tract may be dissected out and the remaining fibers of the muscle sewed together, thus preserving the contour of the anus and the functions of sphincters.

OCCULT HEMORRHOIDS FROM THE RECTUM.

Doctor William M. Beach, of Pittsburg, stated that—

(1) Occult blood in the stool indicates disease high up in the gastrointestinal tract.

(2) Accompanied by certain rational symptoms as pain localized, the origin of occult blood can be noted.

(3) The discovery of blood in the stool may enable us to predict hemorrhage or prevent disaster.

(4) The most frequent sources of occult blood are in the order named: stomach, duodenum and caput coli.

(5) The aloin-turpentine test as practiced by Doctor J. Dutton Steele, of Philadelphia, is recommended.

(6) Proctologists should make an examination for occult blood a routine practice in cases of anemia accompanied by diarrhea or constipation.

ETIOLOGY AND SYMPTOMS OF FISSURE.

Doctor Collier F. Martin, of Philadelphia, said that the fissure is usually situated posteriorly and directly over the "white line" of Hilton, due to the arrangement of the fibers of the external sphincter and to the fact that the anal canal has less elasticity directly over that line. Most fissures start as the result of the distention of the canal by hard feces and excessive straining at stool. Those situated anteriorly are often seen after confinement, due to the pressure of the fetal head upon the perineum.

The sentinel pile is noted in most cases if the fissure has been present for any length of time. It is a simple inflammatory hypertrophy. Hypertrophy of the anal papillæ does not appear to be an important factor in the causation of fissure. True hypertrophy of the sphincters is rarely seen, but in its place we find an excessive irritability of the external sphincter.

The distinctive symptom of this disease is pain or sphincteralgia, preceded by a "pain interval" of from one minute to an hour, during which time the patient has comparative comfort. The pain is caused by spasm of the sphincter compressing the nerves in the ulcer. This contraction interferes with the perianal circulation and renders the inflamed nerves more sensitive. The "pain interval" is caused by a temporary improvement in the perianal circulation produced by the straining efforts at stool.

The constipation of fissure often precedes the formation of the ulcer, an irritable sphincter being the underlying factor in the production of this condition. The constipation increases after the formation of the ulcer, due to the fear of the patient of the pain following stool.

The treatment consists in the divulsion of the sphincters and the usual stimulating after treatment. The sentinel pile should be removed at the time of divulsion. Division of the external sphincter is not advised, for frequently it does not unite and eventuallly atrophies. Fistulæ, abscesses and fecal impaction are mentioned as frequent complications of fissure and call for appropriate treatment.

LOCAL VERSUS GENERAL ANESTHESIA IN RECTAL SURGERY.

Doctor George B. Evans, of Dayton, Ohio, stated that pain naturally is the common curse and dread, though relatively essential of the human family. The law of self-preservation when an individual is threatened with pain is at once a law of resistance, manifest by intense expectancy and defiant attitude.

The shock incident to the terror of pain is incomparable to that which is likely to follow an abbreviated use of a general anesthetic. In consideration of the evolutionary plane occupied by the average American of today and the more remote period of his removal from the gorilla peripherial sensibility of the jungle, we are forced to conclude that he is more sensitive, and in need of greater consideration for the relief of pain. Because an operation can be done painlessly, it does not follow that there will not be subsequent suffering and some, and perhaps severe, shock.

But in this nerve block period of Creile and Pennington, and the Gant period of dermal and subdermal distention, we are told there is scarcely any use any more for a general anesthetic. Do we not believe, as proctologists, that in our operative field sensibility is most difficult to abolish, and would it not naturally appear that more narcosis is necessary in this kind of surgical work, and as a consequence more shock? Again, would it not be possible by the combined use of general and local anesthesia that less shock would ensue and more operations could be made with success. I believe that by using the local anesthetic preceding the general anesthesia we lessen the amount of the general anesthetic appreciably, diminish the dread and fear, and consequently diminish shock and danger thereby. Therefore, the combined method of narcosis, less anesthetic, suspending shock incident to conscious dread, as well as anesthetic shock, rendering more complete operative area and consequently more satisfactory work. It is simple to operate upon prolapsing piles, but not so simple to operate upon piles above the sphincters yet demanding operative interference.

The injections of sterile solutions disturbs the parts anatomically. The frequent punctures through the tissues invite infection and infection trouble. You can never measure the nerve and seldom the surgical all of your patient. Its chief advantage is that occasionally you are able to do work in your office, and even then unsatisfactorily.

I fail to see the advantage of operation under local anesthesia in an office, and follow the patient home and give hypodermic of morphia, over the usual custom of operating at home in the first place.

An operation for hemorrhoids is a matter of some seriousness, often attended by some shock, often bloody, and the greatest caution should be observed that asepsis be obtained.

I do not think it best for patients that general practitioners should be taught that aseptic precautions at the time of operation, and rest at home for a few days, is unnecessary. Do we not magnify the applicability of local anesthesia, will not accidents occur, are we not sacrificing perfect scientific work, are we not belittling our chosen work—a class of operations that are important and not free from danger?

THE SIGMOIDAL FACTOR IN CONSTIPATION.

Doctor Edwin A. Hamilton, of Columbus, Ohio, said that in a certain per cent of intractible cases of constipation organic change in the wall of the sigmoid is the controlling factor. This change is entirely independent of any disturbance which may occur on the outer surface of the viscus; for example, malposition and pathologic flexures due to adhesions. The change in the gut occurs in the submucous and muscular coats, and consists of a round-cell infiltration of these coats which subsequently contract, thereby to a greater or less degree narrowing the lumen of the bowel. The round cells change into spindle cells, subsequently undergoing a metamorphosis into true connective tissue. The contraction of this connective tissue so narrows the caliber of the sigmoid that constipation of an obstinate type must result. This change is not always limited to the sigmoid; it frequently involves the descending colon as well. In addition to the contraction of the gut it loses also its resilience, which further adds to the difficulty of the passage of fecal debris. The etiologic factor is the absorption of bacteria and toxic products from the sigmoidal contents. The mesentery is also involved, and is thickened and shortened. The whole process is chronic, several years being required to bring on the condition. Surgery offers the only relief; an anastomosis must be effected by any suitable surgical procudure between the unaffected position of the intestinal tract above and below the lesion.

A REPORT OF TWO CASES OF SIGMOIDOPEXY.

Doctor Samuel T. Earle, of Baltimore, said that in one of the cases there was the third degree of prolapse of the rectum, the invagination of the upper part into the lower portion of the rectum; in the other case there was a very acute flexure of the sigmoid upon the rectum, both of which conditions, as is well known, are frequently due to an abnormally long mesosigmoid. The symptoms in each case were obstinate and persistent constipation, frequent bearing down pains in the lower pelvis, a sense of weight and especially a feeling of unrelief for some hours following a stool, or an attempt at the same. Associated with these local symptoms were darting pains in various parts of the body, nausea, anorexia, frequent headaches and the various neurotic symptoms that go to make up a typical case of neurasthenia. The case of invagination was diagnosed positively by a digital examination while straining at stool, the sulcus being distinctly felt with the finger. The case of acute flexure was diagnosed by means of the protoscope, the flexure being so acute that it was only possible to enter the sigmoid with the protoscope by getting the end of the latter around the flexure and pulling it aside. The flexure was so acute that it obliterated the lumen of the bowel at this point. The technique of the operation is such as is given in Tuttle's and Gant's works on "Diseases of the Rectum and Anus." I met with no special difficulty in performing the operations. The mesosigmoid was very long in both. I was particular in pulling off the abdominal peritoneum where the sigmoid was to be held in apposition, and also in attaching the sigmoid to the transversalis fascia. Both cases made good recoveries, except that one was retarded by a stitch abscess. The results in both cases were most satisfactory and pronounced, with almost immediate relief of the persistent and obstinate constipation, with the gradual disappearance of the neurotic symptoms. Doctor Gant has recently reported a number of sigmoidopexies and colopexies with most satisfactory results.

Doctor Clark, in a paper read before the Medical and Gynecological Sections of the Medical and Chirurgical Faculty of Maryland, on February 15, 1907, called attention to the frequent associations of gastroptosis, floating kidney, and enteroptosis in the same individual.

FECAL IMPACTION.

Doctor Lewis H. Adler, Jr., of Philadelphia, in a paper entitled "Fecal Impaction," called attention to the result of obstipation, or an attack of constipation causing an accumulation of feces in the cecum or in any part of the colon; but the term impaction, the subject of the paper, should be usually employed when such an accumulation occurs in the pouch or ampulla of the rectum, or in the sigmoid flexure.

Attention was called to the difference between an ordinary persistent constipation and an impaction. The latter may follow from a single attack of constipation, whereas obstinate constipation may never, or only after a long period, cause impaction. The symptoms of the two conditions are also very different, as an impaction is usually marked by a diarrhea, whereas chronic constipation is associated with costiveness. After calling attention to the various causes of the malady under consideration and the symptoms of the same, the treatment was detailed as consisting primarily, in the removal of the mass, and, secondarily, in the relief of the inflammation of the mucous membrane occasioned by the irritating presence of the fecal matter as well as the removal of all causes which contribute to the constipated habit, which is undoubtedly the prime factor in most cases in producing an impaction.

The easiest manner of breaking up the fecal mass is to put the patient under an anesthetic and then to forcibly divulse the sphincters, after which the mass may be disintegrated by means of the finger, a lithotomy scoop or an old-fashioned iron spoon. In women considerable assistance may be rendered by passing a couple of fingers into the vagina and by this means steadying the mass so that it may be the more readily broken. In some instances the writer was able to break up an impaction without resorting to anesthesia, simply by using the finger and sometimes by the additional use of a bivalve speculum and a rectal scoop or spoon.

Previous to resorting to instrumental aid in the removal of the impaction, the fecal mass may be softened and its passage facilitated by the use of enemas. Especially is this so in cases in which the sigmoid is the part affected, in which situation material assistance cannot be gained by the employment of instruments. For the purpose of administering the injection a douche-bag holding several quarts is to be preferred. The injection substance should be composed of soap and water, to which I have found the addition of glycerine of considerable benefit, a dessertspoonful to a quart. When the impaction is in the sigmoid, the injection should be given through a Wales bougie, preferably the one modified by Doctor Dwight H. Murray, of Syracuse, New York, which is stiffer than the ordinary article sold, which latter is frequently useless for the purpose intended, as it readily doubles on itself, and a high injection is rendered impossible by its use. When this method is employed the patient should be placed in the knee-chest posture.

A word of caution should be given here as to the danger surrounding the unguarded use of drastic purgative drugs in cases of impaction. By their employment peristalsis is increased and the fecal mass softened, but the bowel in its inflamed and distended condition may be thereby the more easily ruptured, and if, in addition, a stricture is present, the caliber of the gut may be entirely occluded by forcing into it the hard fecal mass with the attendant symptoms and consequences of total obstruction of the intestines. So much for the treatment of the actual impaction.

PRURITUS ANI: IS IT A DISEASE PER SE OR MERELY A SYMPTOM?

DOCTOR LOUIS J. KROUSE, of Cincinnati, quoted from the works of Bodenhamer, Agnew, Wright, Ball, Cripps, Gant, Matthews, Tuttle, and others, their opinions regarding the etiology of this disease, and then stated that "Pruritus ani essentially is a disease which is due, not to a local, but to a constitutional cause, and is caused by some trophic changes in the nerves supplying the parts." He further stated that the changes occurring in the skin of the anus and surrounding parts, namely, the hypertrophy, the loss of pliability, and the absence of pigment, can only be explained on the faulty nervous supply of the parts. He showed that an increase of pigment ought to accompany severe itching, and not a total disappearance, and finished his article by saying that "the absorption of the normal coloring matter of the affected area does occur, notwithstanding that the epidermis was not destroyed," and said "a similar process of absorption takes place in leucoderma." All authorities acknowledge that the cause of the latter disease is to be found in the nervous system, and conclude with the statement that "pruritus ani, at least in such cases, is a disease *per se* and not a symptom."

SCIATICA AND HEMORRHOIDS.

DOCTOR DWIGHT H. MURRAY, of Syracuse, New York, reported the case of a man forty-eight years old who had been troubled with sciatica in the right leg for two years, and had also been a sufferer from hemorrhoids for ten years, having frequent profuse hemorrhages therefrom.

The hemorrhoids had not been treated. The sciatic nerve had been stretched and treated by various methods, by a physician at his home town, included in which was the following, completed in three sittings two days apart: At the first sitting, six hypodermic injections of 1/150 grains of atropin each were given into the sheath of the sciatic nerve. At the second sitting, seven injections of the same amount. At the third sitting, eight injections were given as before, and one extra into the nerve before it leaves the pelvis. The patient was unconscious for fourteen hours after the last sitting; very little improvement resulted.

In November, 1906, the author was first consulted, and on December 12, 1906, operated on him for internal hemorrhoids. He made the usual recovery up to the ninth day, when there was a sudden profuse secondary hemorrhage. The patient was almost exsanguinated before the author arrived. He immediately examined and found the superior hemorrhoidal artery throwing a full-sized stream. This was secured, the patient stimulated, and an uneventful but slow recovery ensued. The patient has had no sciatic pain since the operation.

Doctor Murray concluded that inasmuch as sciatica is often symptomatic, that no such severe treatment is justified until all possible reflex causes are first removed.

The cause of the hemorrhage was probably due to the thrombus or eschar at the end of the vessel being thrown off before thorough healing had taken place, and was influenced largely by his general anemic condition before operation.

THE TREATMENT OF ISCHIORECTAL AND PELVIRECTAL ABSCESSES.

Doctor T. Chittenden Hill, of Boston, said that he employed general anesthesia produced with ethyl chlorid for the ischiorectal abscess, and ether anesthesia for the pelvirectal abscess.

His experience with infiltration anesthesia has been unsatisfactory. He emphasized the importance of an early incision for perirectal abscesses, claiming that when acute symptoms have existed for a day or two, with pain and tenderness, even before there is much edema or discoloration of the skin, long before fluctuation can be detected, an incision may prevent abscess-formation by allowing the escape of blood or serous exudate from the engorged blood-vessels.

He advised a T incision and breaking up the existing septa with the finger, after which the sphincters are to be divulsed. He believed squeezing, scraping or disinfecting an acute abscess to be a great mistake, as it only serves to destroy the new granulation tissue and to spread the infecting bacteria. For the deeper ischiorectal and in all pelvirectal abscesses he recommended rubber drainage tubes, discarding their use as quickly as possible in the after treatment.

He believed that the great majority of pelvirectal abscesses should be reached by perineal dissection.

CRYPTITIS.

Doctor J. Coles Brick, of Philadelphia, said that the anal valves and crypts, first pointed out by Morgagni, and called after his name, are found as vestigical remains of the junction of the rectal mucous membrane with the skin. They vary in number and size, but are absent in the anterior and posterior commissures. They have no known functions, but are the cause of obscure symptoms, when diseased, and from the fact that the valve or covering part of the crypt may conceal the diseased area, repeated examination will fail to show the lesion, unless each crypt is probed, when tenderness or pain will be felt. A conical fenestrated speculum is the best to use, and when the diagnosis has been made, the valve should be removed and the crypt converted into a raw surface, so that healing will obliterate it.

OBSERVATIONS ON CERTAIN POINTS IN THE ANATOMY AND PHYSIOLOGY OF THE RECTUM.

Doctor A. B. Cooke, of Nashville, Tennessee, expressed the view that the usual conception of the external sphincter muscle is erroneous; that under normal conditions it is not in a state of tonic contraction, but, on the other hand, is at rest and passive, the shape of the muscle and the arrangement of its fibers being such that the anal aperture is maintained in a state of passive closure. It is not conceivable that a *voluntary* muscle should require the constant action of nerve force to keep it in a state of rest. The only action of this muscle is to voluntarily oppose or terminate the act of defecation by tonic contraction.

With reference to the internal sphincter, the essayist observed that there is no occasion to credit this muscle with any special action in addition to that of the circular coat of the bowel, of which it is a part. By reason of its location and thickness, it probably exercises some passive sphincter control, but its chief action is undoubtedly that of a detrusor, serving to complete the expulsion of feces and keep the anal canal free of contents.

The levator ani muscles, acting together, constitute the sphincter of the proximal extremity of the anal canal. To understand this it is only necessary to remember (1) that the upper or pelvic surface of these muscles presents a deep, funnel-shaped concavity, the beginning of the anal canal being at the lowest point; (2) the strong bundles of fibers which unite immediately behind the rectum arise in front from the pubis and anterior portion of the fascial line and pass downward and backward in close relation with the lateral walls of the rectum, crossing it obliquely at the upper limit of the anal canal.

The well-known difficulty of voiding urine while a costive stool is being expelled, which is usually attributed to the action of the levatores ani, is due rather to the pressure of the fecal mass upon the prostatic and mebranous portions of the urethra, since, at the time of defecation, these muscles, like the sphincters, must be in a state of relaxation.

The part played by the anal canal in defecation is purely passive, except at the completion of the act, when the voluntary muscles which enclose it are strongly contracted, expelling any remnant of feces and bringing its walls again into their normal relation when at rest of close apposition.

The essayist dissented from the commonly accepted teaching that there is an inhibitory center in the cord which presides over the action of the external sphincter, and which is called into action at the time of defecation to inihbit its tonicity.

The relaxation which occurs at such times seemed to him fully explained by the mechanical pressure of the descending mass upon a structure which only offers passive resistance unless contracted by voluntary effort, and which possesses sufficient resilience, independent of any nerve influence, to regain its normal form and tone as soon as the pressure is removed.

EXHIBITION OF INSTRUMENTS.

HEMORRHOIDAL CLAMP.

Doctor Dwight H. Murray, of Syracuse, New York, presented a new hemorrhoidal clamp which has the following qualities in combination to make a first-class instrument, namely: Scissors-shaped, parallel jaws; can be closed and released instantly without the use of a thumb screw, thereby saving much time while operating. The Goodell dilator reversed is used as the ground principle for the lock.

ORIGINAL ABSTRACTS.

SURGERY.

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SURGICAL TREATMENT OF TUBERCULOSIS OF THE KIDNEY.

In *Surgery, Gynecology and Obstetrics*, Volume IV, Number III, especial stress is laid by Kelly upon the value of radical surgery in the treatment of tuberculosis of the kidney. His experience with this infection includes fifty-seven nephrectomies, four nephrotomies and one partial nephrectomy.

The value of an expectant or medicinal treatment for this disease is practically *nil*, where the tuberculosis has been fully demonstrated. The fresh air and forced feeding treatment, so valuable in pulmonary phthisis, has no useful effect here; indeed, patients undergoing this treatment show marked evidence of an advance of the disease. Pseudocures are sometimes recorded by the encapsulation of the diseased kidney associated with an occlusion of the ureter, but in these cases the disease may long remain dormant only to break out afresh later. In these cases where the kidney has been completely destroyed and the ureter occluded, extensive bladder tuberculosis has also been found, and in some instances tuberculosis of the second kidney as well.

In questioning the medicinal treatment the occasional extreme chronicity of the disease must be taken into consideration. The average duration of the symptoms in sixty-two patients has been three and one-half years; in one the symptoms had been present for thirteen years—in this case one kidney was nearly completely destroyed while the other one was healthy. Generally the disease also sooner or later involves the bladder, causing so much suffering to the patient that the tardy death through involvement of the other kidney or through metastases to other parts of the body is to be longed for.

The origin and course of the disease is as follows:

(1) Tuberculosis of the kidney, not including general miliary tuberculosis, is always unilateral.

(2) Tuberculosis of the kidney is practically always in its origin hematogenous.

(3) Primary tuberculosis of the bladder is rare.

(4) Bladder tuberculosis responds to suitable treatment after a nephrectomy but not before.

Operations to be considered are: nephrotomy, partial nephrectomy, and nephrectomy.

Nephrotomy should be used in desperate cases of pyonephrosis, and must always be followed by nephrectomy after a period of about two months, when the other kidney is nontubercular. Where both kidneys are gravely involved in the tuberculosis, nephrotomy should be the only operative procedure.

Partial nephrectomy has had small range of application and very little success. However, a rare condition in which it is indicated is when one-half of a horseshoe kidney is tubercular.

Nephrectomy is the operation of widest application and should always be done if possible. It should be done as soon as the diagnosis has been made, especially if the disease has not involved the bladder or the other kidney. However, involvement of the bladder, far from being a contraindication is a marked indication for nephrectomy. The bladder cannot be healed as long as a tuberculous kidney pours down infectious matter into it. The mortality has been in his cases thirty-three and one-third per cent of those operated upon. The causes of death have been two from anuria, one died of peritonitis, the other of what seemed a general infection—in the cases of his four primary deaths.

Of the secondary deaths three of the five were from involvement of the remaining kidney. Of the two remaining deaths, one was from heart failure and one from an unknown cause, forty days after her operation.

Tuberculosis of the genitalia is found as a more frequent complication in men than in women. In operating, the tubercular genitals must be removed as well as the kidney; this is a very successful procedure as out of five operated cases three are entirely recovered, one has recently been operated on and one died from the operation.

Tuberculosis in other parts of the body as pulmonary, joint, or glandular, if not extremely active, is no contraindication to an operation. After nephrectomy thirteen have apparently recovered and been well for longer than two years, three have been operated on within two years, and three have died.

Tuberculosis of the second kidney seems to be benefited by removal of the worse kidney where the worse kidney is not secreting at all or very little; in this case the removal of the worse kidney seems to help the general condition remarkably if only temporarily. Seven cases have come under his observation including the nephrotomies and, except in cases of pyonephrosis where nephrotomy has an excellent effect, it is but a palliative measure.

The presence of hyalin and granular casts and albumin in the urine is not a contraindication to operation. In four cases out of five they disappeared shortly after the nephrectomy, and in the fifth case, a true nephritis, the patient has been a school teacher for seven years.

In three of his nephrectomies the nontubercular kidney has had a well defined colon bacillus pyelitis; in these cases the patients are alive thirteen, seven and four years after the operation.

In bladder tuberculosis it has been generally found that the bladder responds to treatment more rapidly if the ureter has been removed with the kidney, an operation to which he has given the name of nephroureterectomy. F. B. W.

HYPOPARATHYREOSIS, STATUS PARATHYREOPRIVUS, AND TRANSPLANTATION OF THE PARATHYROID GLANDS.

Parathyreoprivus and hypoparathyreosis are terms proposed by Halsted (*American Journal of the Medical Sciences,* Volume CXXXIV, Number I) to designate the state of the individual suffering from partial or complete loss of parathyroid tissue. This condition, hitherto described only in the tetanic stage, was observed for fourteen months in a case operated upon by the author, and forms the subject of an interesting article on this little understood disease. The patient, whose left lobe of the thyroid had been removed, returned after about two years to have the remaining lobe removed. In the course of the operation a portion of the lower parathyroid gland was excised and the four thyroid arteries were tied. She was unnaturally flushed for two or three days; was restless and slept badly. Beginning with the eighth day she had attacks or "spells" of numbness and looked alarmingly ill. Six dried parathyroids of beeves were administered by mouth every three hours at first, but in a few days the dose was reduced to one gland three times daily. During most of the time the patient remained in the hospital fresh glands were substituted for the dried specimens, and were found more efficacious. After about seven months their use was discontinued. A year after the second operation the patient was considered to have in some way slowly improved. She had gained a little in appetite and in strength and considerable in weight, but was an invalid. Her nervous system was wrecked, and conversation or slight exercise unnerved her. At times motion produced constant and distressing pain in knees, elbows, and shoulders.

As showing the occurrence of tetany the author quotes fifty-two extirpations of the thyroid gland in Billroth's clinic, with tetany occurring twelve times, and death in nine of these. Of thirty cases of tetany reported by Von Eiselberg in 1890, seven are said to have recovered, three to have suffered chronically from the affection, and thirteen to have died. Of Billroth's twelve cases, one recovered and two became chronic.

Halsted states that the surgery of exophthalmic goitre centres in the problem of removing the greater portion of the thyroid gland without sacrifice of the parathyroids. These bodies, usually two on each side, are likely to be encountered at any level from the superior to the inferior pole on the posterointernal surface of the gland, but most commonly just internal to the rounded posteroexternal border and quite regularly near the site of the distribution of the terminal branches of the inferior thyroid artery. The author states that they may be identified with the naked eye as little ovoid, spheroid, lenticular, or very flat bodies, and often resembling fat in consistence and in color. Tetany he regards as caused less often by removal of parathyroids than interference with their circulation. For this reason he advises leaving a slice of the thyroid gland in the region of the ultimate distribution of the inferior thyroid artery, and in order to avoid wounding a small branch to the superior parathyroid, would slice through the gland a little below the superior pole. F. B. W.

PEDIATRICS.

ARTHUR DAVID HOLMES, C. M., M. D.

STUDY OF RELAPSES IN TYPHOID FEVER OF CHILDREN.

Koplik and Heiman (*Archives of Pediatrics*, January, 1907) say that we may define relapse as a repetition after complete defervescence of some of the essential signs of the primary disease. We are really in ignorance as to the exact etiologic factors favoring a secondary autoinfection with typhoid poisoning. "Relapses in typhoid fever in children are more common than in adults. The mortality is exceedingly low, and the usual duration of a relapse in a child is from one to two weeks. As a rule the temperature is continuously high between a rapid rise at the onset and a rapid fall to the normal at the termination of the relapse. A constant symptom in addition to the prolonged temperature elevation is enlargement of the spleen. Roseola is present in about seventy-five per cent, leukopenia in about sixty per cent, and mild abdominal symptoms in about fifty per cent of relapses in children. Complications in these cases are mild and infrequent. For the prediction of a relapse no reliable signs are furnished by the character of the interpyrexial period, nor by the course, duration and severity of the original attack. Persistent enlargement of the spleen after defervescence occurs in a fair proportion of relapse cases, and a relapse following a mild, primary illness is not as likely to be repeated as one occurring after a severe original attack."

OTOLOGY.

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OTITIC MENINGITIS.

Doctor Knapp (*Archives of Otology,* Volume XXXVI, Number IV) notes that this condition occurs as frequently after acute otitis as it does after the chronic infections of the middle ear, and that in seventy-five per cent of cases the menings are first infected in the posterior cranial fossa. Further, he discusses the subject under the following heads:

FORMS OF MENINGITIS.

(1) *Serous meningitis.* Here the process does not pass the dura and may even remain in the labyrinth. Meningitic sypmptoms supervene, characterized by an increase in cerebrospinal fluid and consequent increase of intracranial pressure. Fluid from lumbar puncture is clear, sterile and under pressure. Recovery follows removal of primary focus and release of fluid. Pathologically, there is a collateral edema of the subarachnoid space near the primary focus.

(2) *Purulent meningitis.*—(a) *Encapsulated form:* Here the dura is penetrated by the process but by agglutination of the membranes the process is localized. Superficial involvement of the brain or brain abcess may result. Puncture fluid is clear or slightly cloudy and may contain bacteria. Some symptoms of meningitis present. (b) *Acute progressive form:* At first this has the general appearance of above form, but owing to leakage from imperfect encapsulation the

infection spreads and gradually becomes general. (c) *General form:* In this type there is no encapsulation and the injection from the start is disseminated throughout the arachnoid cavity giving rise to general meningitis symptoms. Lumbar puncture gives a distinctly purulent, bacterial fluid.

Symptoms.—No single symptom is characteristic, and diagnosis is frequently very difficult. Kernig's sign is most constant. Lumbar puncture is of great aid in diagnosis as to character and variety of the infection, but is not infallible. When the process begins in the posterior fossa there is rigidity of neck and signs of spinal involvement, pain in back and rectum, painful defecation, incontinence of urine and feces are first observed.

Prognosis.—In purulent cases it is unfavorable, but as Heine has said, in the circumscribed and acute progressive types, certain cases are curable, though when the process is general it is absolutely bad. Lumbar puncture is helpful, and other factors, such a general condition of patient, nature of ear trouble, and previous operative findings must be considered.

Operative treatment.—Free removal of source of infection, drainage of exudation, and use of appropriate antitoxin are of first importance and form the general principles underlying operative or therapeutic intervention. Exposure of infected area, if in middle fossa, is usually simple, but when in the posterior cranial fossa it becomes much more complicated though accessible sometimes by removal of petroses pyramid and sacrifice of portion of labyrinth. The keynote of treatment is, as it is in peritonitis, a more thorough removal of the primary focus, which in many cases means early recognition and proper treatment of labyrinthine suppuration. M. L. C.

DIAGNOSTICS.

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A NEW FLUID FOR THE HEMATOCYTOMETER.

EDINGTON (*The Lancet,* July 13, 1907), calls attention to the fact that few of the ordinary diluting fluids are isotonic with the blood, as used, and that, as a consequence, incorrect counting is common. Further, inasmuch as the specific gravity of the blood varies from the normal (1058 to 1062) in disease, the hemoglobin varies in similar ratio. Thus, if solutions preventing coagulation are used as ordinarily for purposes of dilution, the hemoglobin that passes into the plasma-layer above the corpuscles acts as a hemolysin. Corpuscular destruction brought about in this way leads to unrealiable counting. Working with potassium citrate solutions, Edington noted that the red cells maintained their shapes and their characters in an astonishing manner.

After thorough trial, he is prepared to recommend the following solution: Neutral sodium citrate, grams 7.5; formalin solution (forty per cent) 2.0 cubic centimeters; dahlia (Grubler's), grams 0.03; chloroform, drops 5, and distilled water, 250 cubic centimeters. The solution is best made by mixing the stain with the water, rubbing down gradually and then adding the formalin solution and the sodium citrate. The combination should be left standing a day or two, and then filtered. It should be kept in a cool and dark place. Frequent filtering is necessary in order to secure the best results.

OPHTHALMO-REACTION TO TUBERCULIN IN THE EARLY DIAGNOSIS OF TUBERCULOSIS.

Calmette (*Presse Medicale,* June, 1907), following the experiments of Vallee ("skin reaction" to tuberculin), worked with tuberculous and nontuberculous children, with the object of determining the ability of the uninjured mucous membranes to react to tuberculin. Calmette chose to experiment on the conjunctivæ of some twenty-five patients. Some of these were known to be tuberculous. Dry tuberculin, precipitated by alcohol at 95°, in a one per cent solution in sterilized, distilled water was used. Care was taken to always work with freshly prepared solutions. One drop as placed in the conjunctival sac. In from three to five hours, the tuberculous patients' conjunctivæ showed, on the palpebral portion, redness, congestion, and edema. There was an abundant secretion of tears and the conjunctivæ became covered with a thin layer of fibrin. The patients did not appear to suffer beyond experiencing slight sensations of burning, and some disturbance in vision. There was no increase in temperature. The noninocculated eye showed no reaction. The reaction reached its maximum in from six to ten hours. The reaction had disappeared in from eighteen to thirty-six hours. In the cases which did not prove to be tuberculous there was little more than slight redness after the instillation of the tuberculin. The advantages claimed by Calmette for this reaction are: its ease of manipulation, its harmlessness, the facility with which its progress may be followed, and the earliness of the positive appearance.

PRACTICAL MODIFICATION OF MILIAN'S SLIDE METHOD FOR DETERMINING COAGULATION TIME OF BLOOD.

Hinman and Sladen (*Johns Hopkins Hospital Bulletin,* June and July, 1907), after an exhaustive consideration of the standard methods for determining coagulation time of blood, recommend the modified slide method, although realizing that it is far from being absolutely accurate. The method suggested is as follows:

Ordinary glass slides are used. The blood is obtained from the ear, the first drop being wiped off and the time counted from the appearance of the second drop. The drops are then quickly picked off for observation. They are taken off on the under side of the slide, so that they have no opportunity to run. The coagulation is complete when tilting the slide will cause no change in the contour of the drop. The size of the drop is the essential feature of the method. Drops four to five millimeters in diameter are best adapted for the work. In the smaller ones the contour changes are difficult to judge. In case of larger drops there is too much evaporation, on account of the delayed time of coagulation. This also applies in cases where the coagulation time is long—as in hemophilia. If there is difficulty in determining the coagulation time by absence of change in contour, the observation may be made by means of transmitted light, and note made of flow by changes in density. Several drops are observed and averaged.

The slide method is recommended because it is quick, convenient, and practical. It can be used in laboratory or sick room. It is reliable and requires no special apparatus. Its chief objection is the exposure and the consequent evaporation. In normal cases, this, however, does not play so great a part. The authors recommend that where the coagulation time is delayed, the drop be examined as bacteria are examined in hanging drops. Mechanical tilting may be a factor in determining more rapid coagulation.

The slides must be absolutely clean.

EDITORIAL COMMENT.

THE ROLE OF INEBRIETY IN THE CAUSATION OF INSANITY.

THE exact relationship between insanity and inebriety seems difficult to determine. Decision as to whether intemperance is the cause or the effect of mental aberration is impossible, but intelligent medical opinion is a unit in the belief that excessive alcoholic indulgence is productive of a change in the pyramidal cells of the cerebrum which eventually results in mental weakness. Statistics bearing on the causation of crime indicate that alcohol plays an important role in impelling the perpetration of malefactions, and likewise summations compiled in asylums for the insane and in institutions for the care of persons whose minds are enfeebled, designate alcohol as one of the prime factors in bringing about the condition. Conversely, Bevan Lewis, who recently investigated the geographic distribution of alcoholism, observed that peoples of the coast counties, who indulge in alcoholic beverages intemperately, manifest the lowest ratios of pauperism and insanity, while inland peoples, who indulge moderately in alcohol, manifest the greatest ratios of pauperism and insanity.

The variance of views entertained by statisticians relegates the question to a complex basis, but notwithstanding the great diversity, argument in favor of abstinence is still warranted when the physiologic aspect of the subject is considered. Primarily alcohol is a strong dehydrating agent, and, since the tissues require a normal supply of water, anything tending to remove this diluent is deleterious to the physical welfare of the individual. Alcohol is not only worthless as an oxidizing agent within the body, but investigation has demonstrated its hampering influence on the anabolic processes of the organism, forming a compound with hemoglobin which renders this constituent less capable of appropriating and abandoning oxygen. Although alcohol enables the body to amass fat the adipose thus gained is abnormal since its acquisition is due to diminished metabolism and to the accumulation of waste products, which under normal conditions would be excreted. Alcohol in small doses causes an increased blood pressure with decreased heat production, which stage is followed by decreased blood pressure and increased generation of heat. Aside from its effect upon the human organism, experiment has demonstrated that protoplasm in general is subject to change .under its influence. Germinating grain and spores are retarded in its presence, and even its own production is inhibited beyond a strength of twenty per cent.

ANNOTATIONS.

THE DAMNABLE OBLIQUITY OF THE DAILY PRESS.

Why the daily press, which holds within its power the uplifting of moral standards, should seize every opportunity to distort and exaggerate declarations intended for the public good, thereby converting truth into sensational canard, is inconceivable. The recent misrepresentation of the statements of Doctor S. A. Knopf, before the National Association for the Study and Prevention of Tuberculosis by overzealous reporters is painful in the extreme. Doctor Knopf is represented as making the assertion that in extreme cases of tuberculosis, wherein cure is impossible, his practice has been to resort to morphin as a means to a speedy and painless end. Happily these gross and unwarranted statements are refuted by Doctor Frank Billings, President of the National Association for the Study and Prevention of Tuberculosis, and by Doctor George Dock, of the University of Michigan. Doctor Dock, who presided at the meeting before which the talk was given, says: "I heard clearly what Doctor Knopf said. I am sure that I know what he meant; and am sure that everybody in the room must have understood what he said. His words could not possibly be converted into the meaning given in the public press. It was perfectly clear that he meant to relieve patients in the last stages. Everybody knows that this prolongs life, while making it very much easier for the patient."

THE PLAINTIVE CRY OF PRENATAL INFANCY.

THE phenomenon of a child *in utero* uttering articulate sound is regarded with more or less incredulity by the medical profession, notwithstanding the occurrence has several times been reported by physicians of more than mediocre attainment. The latest obstetrician to announce prenatal vocal activity is Blumm, of Bayreuth, who was called to deliver a woman on the occasion of her third confinement. Being informed that on the previous evening the amniotic membrane had ruptured spontaneously and discharged the fluid, Blumm immediately placed the woman transversely in bed, flushed the vagina, introduced his finger and hooked it into the groin of the fetus, the head still being in the uterus. The muscles of the infant contracted and those witnessing the accouchment—doctor, father, patient, and midwife—distinctly heard from within the abdomen of the woman the cry of a child. While the legs were being drawn down the cry was repeated five or six times. Delivery was complete without mishap. Blumm explains the happening by the belief that after rupture of the sac the rather high breech did not completely close the cervical aperture, thus admitting air and enabling the child to breathe before birth.

CULTURE OF THE PATHOGENIC ORGANISM OF PLAGUE.

PERHAPS plague is responsible for more deaths than any other disease known to medical science. Certainly it is the most persistent in epidemic form, and while it has engaged the attention of medical workers in the Orient for years, successful combat of its ravages was impossible while the etiologic factor remained unknown. Kitasato and Yersin established a new era in the intelligent comprehension of the disease by discovering the plague bacillus. Simpson, who has long been identified with medical research in the far East, and who delivered the first of the Croonian lectures, gives an interesting description of the morphology and methods of culture of the organism. Broth as a culture medium establishes a definite test for the bacillus, since no other variety gives such characteristic stalactite formation. In dry agar the involution forms assumed by the organism are characteristic alone of it, and are possible of production only with bacilli removed from the bodies of plague subjects.. Moreover, these involution forms are many times larger than the unattenuated organism, are spherical in form, and quite closely resemble yeast cells. Dry agar likewise furnishes another test which is, perhaps, peculiar alone to the plague bacillus. When reflected light is made to play upon the tube held in horizontal position with the culture down and examination is made through the depth of the agar it has the appearance of the sheen seen in the back of a mirror. Of course, the old reliable test by inoculation of rats, guinea pigs, and other susceptible animals, furnishes the most popular method of diagnosing the malady.

MEDICAL NEWS.

BURRELL OF BOSTON.

THE accompanying illustration represents the President-Elect of the American Medical Association—Herbert Leslie Burrell. The position now occupied by this gentleman places him in the limelight. His past record is unimpeachable; his future record is undeterminable. He is a Bostonian by birth, and first saw light on April 27, 1856. His preliminary education was acquired in the public schools of the Hub, and his collegiate training was received at the medical department of Harvard, from which he graduated in 1879. Ater devoting a few years to private practice, he elected, in 1886, to teach medicine, and entered upon this career as demonstrator of surgical technique at his alma mater. Determined to reach the goal, he advanced by degrees until a life position on the faculty was secured, the title sought being full professorship of clinical surgery. Doctor Burrell is known as a surgeon, an educator, and an organizer.

CAT.

In the capacity of surgeon he was one of the first to make a successful ligation of the innominate artery, and the first to successfully reimplant a whole trephine button. He was appointed Surgeon-General of the Massachusetts Volunteer Militia in 1893; Surgeon-in-Charge of the hospital ship, *Bay State,* which Massachusetts sent to the Spanish-American War in 1898, and at present enjoys connection with several Boston hospitals. ·

As an educator, he advocates the idea that laboratories and research agencies are for the benefit of the people, and is a staunch believer in the continuous teaching service, realizing "the dependence of technic on an unbroken period of training and practice." As a means of disseminating his ideas regarding surgical practice he is now preparing the copy for a work on surgery that will soon be published by Blakiston in one large royal octavo illustrated volume.

As an organizer, he achieved reputation for the model system established in the conduct of the affairs of the state militia, and in other enterprises where executive ability figured as a factor, notably as chairman of the Committee of Arrangements for the Boston meeting of the association last year. The choice is considered excellent.

MINOR INTELLIGENCE.

THE Warren prize for 1907 has been awarded to Doctor Aldo Perroncito, of the University of Pavia, the title of his essay being *"La rigenerazione dei nervi."*

INDIANA is contemplating the establishment of a state epileptic colony. Twelve hundred acres of land in the city of Newcastle were recently purchased as a site.

THE University of Paris enjoys a medical registration of 3,369 students. The total enrollment of the medical schools of France is 8,297, of which number 796 are women.

STRATHCONA has been chosen as the location for the proposed Provincial University of Alberta. Two hundred fifty-eight acres have been purchased as a site at a cost of $150,000.

THE state veterinarian of Missouri, Doctor D. F. Luckey, is credited with the statement that the milk of tuberculous cattle is more responsible for the spread of consumption than any other cause.

THE medical department of Columbia University has recently acquired two new professors: Doctor Porter F. Chambers for the chair of gynecology, and Doctor Simon Baruch for the chair of hydrotherapy.

A CASE of leprosy is reported from the Massachusetts General Hospital, Boston, the subject being a Russian. The diagnosis has been confirmed and the victim assigned to the leper hospital on Penikese Island.

DOCTOR CRAWFORD LONG, who did pioneer work in anesthesia, has been selected by the state of Georgia as one of two persons whose memory shall be commemorated by a statue in the Capitol at Washington.

LONDON, Ontario, is to have an isolation hospital, the site having recently been selected. Accommodations will be afforded to one hundred twenty patients and the contemplated structure will cost approximately $50,000.

PROFESSOR GRAUCHER, of Paris, one of the most eminent physicians of France, died recently. Tuberculosis was his main field of activity, but he was with Pasteur when that scientist made the first injection for the cure of hydrophobia.

THE City Hospital and City Home on Blackwell's Island, New York City, have been enriched by an endowment of $300,000 from Mrs. Russell Sage. The gift will insure a substantial basis for the laboratories of the above institutions.

STATISTICS compiled during 1905 show more than 119,000 insane persons in England and Wales. Of this number over 55,000 were males and 64,000 females. This is an average of one insane person to every two hundred eighty-five of the population.

A PETITION has been presented to the Board of Education of London, signed by fifteen thousand medical men, asking that more thorough instruction be imparted to school children regarding the physiologic effects of alcohol on the human body.

FIVE hundred thousand dollars has been deposited by Andrew Carnegie in the Bank of England as a contribution to the King Edward Hospital Fund, which is doing excellent service for the hospitals of London, about £100,000 being distributed annually.

LYNN (Massachusetts) Hospital has acquired, through the generosity of its vicepresident, Mr. Newhall, the ten thousand square feet of ground immediately adjoining the hospital grounds proper, and opportunity is thereby assured for further expansion.

DOCTOR WILLIAM LAMBERT RICHARDSON, dean of the Harvard Medical School since 1893, recently tendered his resignation to take effect September 1, 1907. Doctor Richardson has likewise been connected with the department of obstetrics since 1871.

THE Sisters of Providence are to open a new hospital in Seattle on Queen Anne avenue, between Republican and Meker. The grounds are spacious, the frontage being over four hundred feet, and the contemplated structures will cost approximately $300,000.

DOCTOR EMMA W. MOOERS, formerly of the pathology staff of McLean Hospital, Waverly, Massachusetts, has been appointed to a position in the University of Munich. At present she is assistant instructor in the Psychitarische Klinik, under Kraepelin.

DOCTOR WILLIAM BAYARD, of Saint Johns, New Brunswick, recently completed seventy years service as a medical practitioner. Doctor Bayard received his degree from the University of Edinburgh, which institution cabled a congratulatory message on the occasion.

REGISTRATION by physicians of all cases of cerebrospinal meningitis in London is now compulsory, the County Council having lately so decided. The step is taken with the idea of enabling the health authorities to more thoroughly study the disease and its method of spread.

THE law recently passed by the Indiana legislature, rendering permissible the sterility of confirmed criminals, idiots, imbeciles, and rapists, under certain conditions, is regarded by enthusiastic humanitarians a radical step toward checking the hereditary transmission of degeneracy. The operation is allowed only in those cases which are pronounced incurable.

BALTIMORE lost one of its most eminent physicians in the recent death of Doctor William T. Howard, at the age of eighty-six years. Doctor Howard was the first incumbent to the chair of gynecology in the University of Maryland. He was likewise one of the founders of the American Gynecological Association, capacitating as its president during 1884 and 1885.

THE College of Physicians and Surgeons of Dallas, Texas, recently purchased a building site for $12,580, and suitable quarters will be erected thereon.

THE Cancer Research laboratory at Buffalo has been granted an appropriation of $20,000 by the New York legislature to facilitate continuance of investigation. Many excellent results have been attained by this institution, and it is regrettable that it cannot be assured of definite income.

THE Cleveland Press, Chicago, is shortly to produce a biography of the late Doctor Nathan Smith Davis. The work will undoubtedly be gratefully received by the medical profession of America, and it is but fitting that the memory of so eminent a physician should be preserved.

THE Doctor Broughton Sanitarium for the treatment of opium and drug habits, located at Rockford, Illinois, has enjoyed such continuous growth that the management has decided to augment quarters. A new wing, sufficiently large to accommodate the increasing business, will be added to the main structure.

THE report of the committee recently appointed by the Chicago Medical Society to investigate the subject of criminal abortion, has been rendered. Much good work has been achieved by the committee, the daily papers almost unanimously cooperating for the suppression of advertisements of this class.

THE presbyteries of Covington, Kentucky, and Lima, Ohio, recently adopted strong resolutions in regard to the appearance of advertisements of patent medicines and reading matter of exaggerated and flagrant character in the columns of religious papers. Several other presbyteries have adopted like resolutions.

THE sum of one hundred thousand dollars will be expended in improving and augmenting the ward space of Mary Fletcher Hospital at Burlington, Vermont. Two new wings, each one hundred feet long and fifty feet wide, will constitute the improvements. One wing will be devoted to medicine and the other to surgery.

THE Department of Agriculture of the Canadian Government has issued fifty thousand circulars to be distributed among the farmers in the interest of pure milk. The importance of clean and cool milk as an adjunct for good butter and cheese-making is emphasized and methods of cleanliness and cooling are described.

NEW YORK has a new floating sanatorium for tuberculous patients. The old ferry boat *Southfield* has been overhauled and moored at the foot of West Sixteenth street, on North River, where patients are daily received. A trained nurse and a staff of visiting physicians minister to the physical necessities of the subjects. Fifty consumptives are at present under treatment.

MANILA'S new medical college is shortly to be opened, the government having appropriated $62,000 for its first year's maintenance. A building formerly occupied by the engineers of the army will be utilized for the initial course, and the intention is that the college shall be a nucleus for the University of the Philippine Islands.

THE health officer of London estimates that $150,000 is paid annually by the people of the world's metropolis for water dispensed in milk. Surely this is a remarkable arraignment of dealers' methods, and it would seem that milk commissions, such as exist in many American cities, might be productive of reform in England.

ONE million dollars have been placed in charge of Booker T. Washington and H. B. Trissell by Miss Anna T. James, of Philadelphia, to be utilized in the rudimentary education of the negro youth of the South. The effort of the colored young man to attain higher education in the absence of lower grade instruction in the southern states impelled Miss James to make the appropriation.

DOCTOR EMMANUEL MENDEL, the eminent German psychiatrist, and professor of neurology at Berlin University, died recently of arteriosclerosis at the age of sixty-seven years. He studied at Berlin and at Breslau and was awarded his degree in 1861. He early evidenced a liking for neurology and in 1873 was appointed to the chair of nervous disease at Berlin, which position he held at the time of his demise.

SEVEN thousand circulars have been sent by the United States Commissioner of Labor to manufacturing concerns throughout the country, which employ large bodies of men, to ascertain whether the practice of drinking would bar a man from employment. Of the seven thousand all but one thousand six hundred thirteen required abstinence, and all of the latter answered that excessive drinkers were promptly discharged.

APROPOS the question of milk, Clarence B. Lane, before the New York School of Philanthropy, expressed some ideas which are worthy of notice. He contends that better milk will be produced when dealers are paid according to quality, and that it is wrong for all dealers to demand the same price, irrespective of content. When clean and rich milk command higher price the individual dealer will strive to produce a better grade.

THE special milk commission recently appointed in New York City has rendered its report to Mayor McClelland. An idea of the immensity of the milk traffic in that metropolis may be gained from the request of the Commission for one hundred additional milk inspectors, whose duties shall be nothing more than supervision, instruction, and encouragement to the dealers to provide good milk. The Commission likewise recommends the appointment of five more bacteriologists and five additional chemists.

REMARKABLE as it may seem England loses about one hundred twenty thousand of her population each year from alcoholic excess. Coming from a less reliable source than the late Doctor Kerr, of London, these figures would perhaps be met with incredulity. Likewise forty thousand people die from causes directly due to alcohol and seventy-nine thousand lose their lives from conditions indirectly associated with the use of spirits and beers.

RECENT LITERATURE.

REVIEWS.

CLINICAL DIAGNOSIS.*

IT is not often that a book written to fulfill two purposes meets with success in as unqualified a manner as does "Emerson's Clinical Diagnosis." In the first place, the object of the author is to present laboratory methods in such a way as to be of most significance to the clinician; and, secondly, to explain to the student and practitioner the simplest technique for carrying on investigations without resorting to laborious methods where accurate knowledge can be obtained with less complicated ones. The book is further of value to the instructor of a clinical laboratory to whom it demonstrates a model manner in which the teaching of laboratory diagnosis should be conducted.

The first chapter is on sputum. Doctor Emerson carefully gives the macroscopic as well as the unstained microscopic examination in such a manner as to encourage the student to make what is frequently neglected yet invaluable—the fresh examination of every specimen. Under the section on staining it is of interest to note his directions for staining the tubercle bacilli by the Ziehl-Neelsen method. He insists on boiling the stain, saying that steaming, a degree of heating successfully employed by most clinicians and by a large proportion of practitioners, "is insufficient."

The author devotes more space to the urine than most text-books of this kind, still the comprehensiveness of the work warrants every line. All the modern dietetic work that has been done on diabetes is thoroughly reviewed and given in a practical form. The description of urinary sediments and especially of casts together with the discussion of their significance is excellent, explaining questions that come daily to the minds of students as well as practitioners.

Less attention is directed to stomach examinations than might have profitably been given. The chemical analyses are sufficiently explained. On the other hand, in place of a somewhat unusual case of jejunal fistula in which some ingenious tests were instituted, a mention of some of the more commonly employed motor power tests would have been of value. The gastric flora is unsatisfactorily treated, the discussion of the presence of the Opler-Boas bacillus being the only redeeming feature of this section. However, an admirable chapter on feces follows, and especially is the work on intestinal parasites well written.

The blood is concisely as well as completely considered. Beginning with general remarks on obtaining the blood, an important preface to the chapter, specific gravity and coagulation-time experiments, counting and staining are demonstrated in a practical manner. Following this a section by Doctor T. R. Boggs, on the bacteriology of the blood, containing a good description of the technique employed in blood cultural work is a valuable addition. After an explanation of serum agglutination tests, the division on the properties of red blood cells follows. It is unfortunate that a colored plate of cells that had been stained by Erlich's stain should be used, inasmuch as this stain is being universally supplanted by the eosin methylene blue mixtures, the author himself recommending Hasting's stain, one of its modifications. The estimation of hemoglobin by the several methods as generally employed is followed by an explanation of the various forms of leukocytes. This leads to the discussion of diseases of blood forming organs and a description of blood changes in acute and chronic diseases. The new plates of malarial organisms are excellent and indeed welcome.

The final chapter on the composition of body fluids and cytodiagnosis gives all that is useful in this regard as far as our present knowledge goes.

The book takes a unique place among texts on clinical methods. Fulfilling the wants of the purely laboratory worker, it explains in a satisfactory manner the clinical features of laboratory findings. It is well printed and illustrated, carefully and thoroughly indexed, and recommends itself to all interested in clinical diagnosis.

*By Charles Phillips Emerson, A. B., M. D., Resident Physician at the Johns Hopkins Hospital; Associate in Medicine in the Johns Hopkins University. Philadelphia and London: J. B. Lippincott Company.

THE HARVEY LECTURES.*

The Harvey Society, organized in 1895, has for its object the diffusion of the medical sciences by means of public lectures. The first course of the series was given in 1905-'06, and the present volume gives the lectures of that course. The lectures cover a great variety of the most important problems in modern medicine and their concise and didactic form makes them especially adapted for busy practitioners who wish to get a brief and yet at the same time authoritative idea of the various subjects. It would be impossible to review such a book adequately and the list of lectures and lecturers will indicate to the reader the interest of the contents: "The Theory of Narcosis," Professor Hans Meyer; "Modern Problems of Metabolism," Professor Carl von Noorden; "On Trypanosomes," Professor Frederick G. Novy; "Autolysis," Doctor P. A. Levene; "A Critical Study of Serum Therapy," Professor W. H. Park; "The Neurons," Professor Lewellys F. Barker; "Fatigue," Professor Frederic S. Lee; "The Formation of Uric Acid," Professor Lafayette B. Mendel; "The Extent and Limitations of the Power to Regenerate in Man and other Vertebrates," Professor T. H. Morgan; "On the Nature and Cause of Old Age," Professor Charles S. Minot; "Modern Views Regarding Placentation," Professor J. Clarence Webster; "Some Phases of Tuberculosis," Professor Theobald Smith; "The Cause of the Heart Beat," Professor W. H. Howell.

*Delivered under the auspices of the Harvey Society of New York, 1905-'06. Price, $2.00 net. Philadelphia and London: J. B. Lippincott Company, 1906.

WELLCOME'S PHOTOGRAPHIC EXPOSURE RECORD AND DIARY FOR 1907.*

We are in receipt of a copy of this book. It is a compact compendium of photographic information, which provides also a pocket note book, a diary and ruled pages for systematically recording exposures in the field or at home. Not only this but the book also gives a clear explanation of the principles which underlie correct exposure, and also provides a mechanical calculator which indicates the correct exposure for any brand of plates, at any season and time of day, by turning *one* scale *once*. It will certainly prove of great value to those interested in accurate photographic work. The book is published in a special edition for the United States. V. J. W.

*Burroughs, Wellcome & Company, 45 Lafayette Street, New York City, and the price is fifty cents.

THE AMERICAN QUARTERLY OF ROENTGENOLOGY.

The recent literature dealing with the Roentgen rays has received no more valuable addition than the official journal of the American Roentgen Society, the *American Quarterly of Roentgenology.* Its editor, Doctor Preston M. Hickey, of Detroit, president of the association, is particularly fitted for the important position of introducing the new journal to the medical profession, by reason of his scholarship, experience, and enthusiasm.

Volume I, Number I, contains a particularly interesting article by Doctor Andrew P. Biddle, of Detroit, on "The Accumulative Experience of the Profession in the Use of Roentgen Rays in the Treatment of Acne Rosocea, Eczema and Psoriasis." The experience and conclusions of over fifty prominent dermatologists and Roentgen ray workers are quoted, and the author concludes with the statement that the best results will not be achieved by him who relies upon *x*-ray therapy exclusively, but by the dermotologist who is also an expert in Roentgen therapeutic technique, and that "the same care and education are necessary to use Roentgen rays in therapeutics as is necessary in diagnosis."

Besides several other articles of merit, the second number contains an article on "Skiagraphy of the Accessory Sinuses of the Nose," by Doctor E. W. Caldwell, of New York. The article is a masterpiece, and the diagnostic plates accompanying the essay are particularly instructive. The author justifies the use of the rays for determining: (1) Anatomical details; (2) Presence of exudates or pus. The details of the technique are given, and the author makes the statement that "In order to use the *x*-rays successfully for exploring the accessory sinuses of the nose, it is necessary to obtain radiographs of very good quality. Such radiographs are not easy to make. They call for the best possible appliances, and an amount of attention to petty details of technique which the busy clinician is unable, or unwilling to give, and of which he has usually not the vaguest idea." This is also the conclusion of every experienced Roentgenologist who has attempted difficult diagnostic work with the rays. Doctor Caldwell concludes his paper with the belief that the method is of about the same degree of accuracy as that of raying for renal calculi. Four cuts of excellent radiographs demonstrate the success of the method in Doctor Caldwell's practice.

The third number is particularly valuable on account of the article on "Experimental and Practical Application of the *X*-ray in Diseases of the Blood and Blood-Forming Organs, with Report of Cases and a Review of the Literature of the Subject," by Henry K. Pancoast, lecturer on roentgenology in the University of Pennsylvania. The paper represents a great deal of work, both scientific and practical, and is a thorough treatment of the subject, which should be read in its entirety to be appreciated properly. V. J. W.

THE PRACTICAL MEDICINE SERIES*

THIS small volume has for its object the review of gynecology for the past year. It is intended chiefly for the general practitioner and is valuable in presenting to him recent advances in the subject. It is noticeable that much important work has not been mentioned; among operations for retrodisplacement, for instance, Peterson's shortening of the round ligaments is omitted. It is also apparent that considerably more space is given to the work of the chief editor than to any other writer, scarcely justified perhaps by any greater amount of effort. The book, while hardly as complete as might be desired, forms a convenient reference to a great deal of recent literature. C. G. P.

*Gustavus P. Head, M. D., Editor. Volume IV—Gynecology, edited by Emilius C. Dudley, A. M., M. D., and C. Von Bachelle, M. S., M. D. Series 1906. Chicago: The Year Book Publishers, 40 Dearborn street.

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ORIGINAL ARTICLES.

MEMOIRS.

THE BACTERIOLOGY OF MEAT POISONING.

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CASES of illness, due to eating various kinds of foodstuff, especially meats, are relatively common. At times affecting a single individual, at others taking the form of a veritable epidemic, these cases have been of great interest for over one hundred years, since the poet, Justinus Kerner, gave the first description of a case occurring in 1793 in Wurtemberg and later, in 1820, called the attention of the physicians of Wurtemberg and Baden to such cases which were of frequent occurrence, following usually the ingestion of various kinds of sausage. Kerner asserted that meat poisoning materially increased the illness and mortality figures of the country, and the older writers attributed a mortality rate of fifty to sixty per cent to such cases. Modern figures show anywhere from twenty per cent to forty per cent mortality.

During the next one hundred years many ingenious hypotheses were advanced to account for the poisonous quality of such meat. Schlossberger considered some poisonous chemical substance to be the causal factor. Smoked meat may contain a certain amount of pyroligneous acid, and to the presence of this substance were attributed many cases, until it was shown that meat which had never been smoked might be as poisonous as that which had. Hydrocyanic and picric acids were also believed to be responsible at one time. Acid botulinicum, so named by Buchner as the causal factor, was shown to have no real existence. Gradually as the new science of bacteriology rose in importance, doctors turned to it for a solution of the problem of food poisoning, and we find many doctors attributing cases of meat poisoning to the action of various germs, one of the earliest described being Sarcina botulina, isolated by Van den Corput. Reports of a large number of cases of meat poisoning occurring in England and on the continent, and in this state have been collected by Vaughan and Novy.[2]

After Selmi's discovery of the "cadaveric alkaloids" many attributed nearly all cases of meat poisoning to such bodies, and the term "ptomain poisoning" has become firmly fixed in the popular mind; but if we will remember that comparatively few of these bodies are toxic and then only in relatively large dose, while the extraction of even a few milligrams of a ptomain demands the use of a large amount of material, we will be better able to understand what a minor role such bodies play.

Van Ermengem[3] quotes Brouardel and Pouchet, who, in a paper before the Congrès Internationale d' hygiène et de démographie, in Paris in 1889, expressed their scepticism in regard to ptomain poisoning, and asserted that their demonstration in suspected food has been the exception, and that the theory is a relic of the old idea of putrid intoxication, when "sepsine" was held responsible for the sequlæ of surgical infections. Spallanzani and Seybert did a great deal of work on putrefaction, in the course of which they repeatedly fed and inoculated animals with putrid material, undoubtedly containing ptomains, yet getting no effect on feeding, though death might follow intravenous injection. Among travellers it has been a matter of common report that the Malay, the Indo-Chinese, the Patagonian, and the Fiji Islander eat meat in all stages of putrefaction without untoward effects, and such meat surely contains ptomains.

Poincarne and Mace[4] and Cassedebat[5] working with ptomains, found them to have little or no effect when introduced into the alimentary canal of animals, though intravenous injection might lead to serious results. Van Ermengem,[6] while working on the Ellezelles epidemic in 1896, fed decomposed ham to mice, rabbits, guinea pigs and cats, always without effect, and similar results have been found by other observers. Lesguillons,[7] in 1902, investigating a small epidemic due to eating sardines, sent some of the material to Doctor Ogier, chemist of the police department of Paris, whose examination for poisons, especially ptomains, was negative. In his report Doctor Ogier cites another case of the same kind where the chemical examination was likewise productive of no results. Then, too, the meat at fault is seldom decomposed, but normal in appearance, odor and taste.

If, then, we cannot attribute the poisonous action of certain meats to the presence of ptomains, what is the causal factor?

(1) Either the presence of some specific, pathogenic germ, not putrefactive in nature.

(2) Postmortem infection of the meat by a certain powerful toxicogenic germ—the Bacillus botulinus.

In the first class of cases the meat may come from a diseased animal, the most common cause of such cases; or the meat may become infected at the time of slaughtering, or it may be a postmortem invasion due to improper handling or storing. In the second class the invasion is always postmortem, the organism showing the characters of a true saprophyte.

In this classification I have left out the transference of a specific disease to man from the meat of an animal suffering with the disease in question, such cases being specific infections rather than cases of poisoning. But we do have instances where tuberculosis, anthrax, trichinosis, et cetera, are transferred to man by the ingestion of diseased flesh. We may also have another class of cases due to eating the meat of healthy animals whose physiologic secretions may be harmful to man, as the meat of certain fish during the spawning season, but such cases do not concern us here.

In 1888, Gärtner, investigating an extensive epidemic of meat poisoning at Frankenhausen, in which fifty-eight people were made ill, several of whom died, found in the suspected meat and in the spleen of a fatal case an organism closely related to the colon group and which he called Bacillus enteritidis. The meat came from a cow slaughtered while suffering from mucous diarrhea, and was eaten raw. Previous to this time similar organisms had been described by several authors, among them being Gaffky and Paak in 1885, but it remained for Gärtner to demonstrate the relation of such organisms to cases of meat poisoning. After Gärtner's publication many investigators found organisms in similar cases, which, while not identical with, yet are very closely related to, the classic organism of this group. That even agglutination tests may fail to give accurate differentiation is shown by the work of Pfuhl[31] in 1900 and of Trautmann[22] in 1903, who in general classify the different organisms isolated to date into entirely different groups.

In 1889 Karlinski[9] found a similar organism in some poisonous dried beef. In 1892 an extensive epidemic of meat poisoning broke out at Morseele in Flanders where over eighty cases with four deaths occurred. The meat came from two calves, one sold after death, the other killed, both suffering with infective enteritis. This meat was partly boiled, partly roasted, and eaten in the form of a pie, and in all cases symptoms of illness followed, showing the heat resistant character of the toxin, one of the chief points of difference between the Bacillus enteritidis and the Bacillus coli. The organism isolated in this epidemic by Van Ermengem[10] he classed as being the Bacillus enteritidis of Gärtner.

In a later communication in 1895 Van Ermengem[8] gave the results of his investigations of one hundred twelve epidemics of meat poisoning affecting over six thousand people, and in one hundred three of these epidemics he found a definite history of the animals having suffered with pyemia, abscess, or various forms of enteritis just before death.

In 1894 Vaughan and Perkins reported a case due to an organism of the colon group. In the same year Basenau reported the results of his work on the epidemic at Rotterdam, two years before, when ninety-two persons were made ill by eating the flesh of a cow. He isolated a germ which he considered identical with his Bacillus bovis mobificans which he had found in the tissues of many sick cows and which he considered to be a distinct germ though related to Gärtner's bacillus, a point allowed by recent agglutination tests. Holst,[12] in 1895, at Gaustad, Norway, found a germ which he considered identical with the organism isolated a few years before by Van Ermengem at Morseele.

Gunther[13] at Posen, 1896, Kaensche[14] at Breslau in 1893, Silberschmidt[15] in 1896, Durham[16] in 1898, Basenau[18] in the same year, and Barker[17] in 1889, all report cases of meat poisoning due to closely related organisms of this group. Bowes and Ashton[19] in 1898, and Crawford[20] in 1899, report cases on which no bacteriologic work was done, yet whose symptomatology place them in this group. Fischer[21] reported an epidemic occurring at Haustedt in 1902, and isolated an organism of this kind. He gives a very complete review of the literature up to that date. In 1903 an extensive epidemic affecting some fifty-seven persons broke out at Dusseldorf, due to the eating of horse flesh, raw and in the form of pie and sausage. One case was fatal. While the organism isolated by Trautmann[22] differs in some points from the classic description yet it undoubtedly belongs, as he says, in the meat poisoning group of the Bacillus coli family.

The following year Fokker and Philipse[23] reported ten cases with one death due to eating meat of a calf slaughtered while sick. In 1905 H. de R. Morgan,[24] in the *British Medical Journal*, gives a critical review of the whole subject with especial reference to the Bacillus enteritidis group.

In practically all the above cases the meat while perfectly normal in appearance, odor and taste at the time of ingestion, came from diseased animals and undoubtedly contained the specific germs at the time of death, and these multiplying with considerable rapidity produced a large amount of toxin, either in the meat itself, or in some cases where the meat was but lightly infected, the poisonous properties did not become manifest until the germs had had time to exert their action within the intestinal canal. While this antemortem infection is the most general, undoubtedly infection with Bacillus enteritidis may occur through improper handling of good meat as shown by Darde and Viger,[25] where a number of cases of poisoning developed following the ingestion of veal. But the meat eaten at first and that carefully kept was harmless, whereas that which had been kept about for several days was toxic.

Aside from the finding of the germ in the suspected meat and in the organs of many fatal cases, a most conclusive proof of the etiologic relation of Bacillus enteritidis to meat poisoning was given by Poels and Dhont quoted by Basenau[18] who inoculated an ox in the jugular vein with Bacillus enteritidis and then killed the animal some twenty minutes later. The germ was recovered from the meat, and of fifty-three persons whom they persuaded to eat of it after it had been kept seventy-two hours on ice, fifteen were made ill, showing typical symptoms of meat poisoning.

While, in the majority of cases, the enteritidis group of bacteria is the chief factor, numerous bacteriologic examinations have revealed other germs as the cause of the poisonous character of the meat. Varieties of the Proteus, notably vulgaris and mirabilis have been found in a good many cases, due most probably to postmortem infection. Still other observers have attributed the poisonous character of the meat to the presence of staphylococci, and the case here reported is one of this kind. Pouchet[26] attributed an epidemic to the bacillus of swine plague, but his description of the germ does not separate it accurately from Bacillus enteritidis. Hamburger described an organism which he called Bacillus cellulæformans, but it undoubtedly belongs in the same group as does Pouchet's.

In 1894 Levy[27] reported an epidemic occurring at Strassburg. There were eighteen cases with one death. The symptoms were bloody diarrhea, vomiting and slight fever, convalescence being established in two to four weeks. From the stools, vomitus and intestinal contents of the fatal case—the blood being sterile,—he isolated a proteus which proved uniformly virulent for animals. The meat was kept in a dirty ice-chest from whose floor Levy isolated the same germ as that found in the meat. Wesenberg[27] four years later investigated sixty-three cases with one death, the epidemic occurring in the district of Mansfeld near Halle. In these cases recovery followed in from three to five days. The cow, the source of the meat, had suffered from traumatic inflammation of the pericardium according to the local veterinarian. Mice were inoculated subcutaneously with beef-tea emulsions of the meat and pieces of meat were also placed at the root of the tail in another set of animals. All died in from eighteen to twenty-four hours to two or three days. A guinea pig was killed by subcutaneous inoculation in forty-eight hours. From the animals and from aerobic and anaerobic plates of the meat a proteus was isolated. In Wesenberg's cases the meat was kept in a very damp, musty cellar and the epidemic was similar to the one at Strassburg, in causal factor, symptoms and results. But while Levy, in a way, attributed the poisonous action to the presence of ptomains, Wesenberg's researches showed that the action was a true infection and that the proteus produced a specific toxin of its own. Glucksmann[28] reports two cases occurring in Canton Saint Gallen, Switzerland, following the ingestion of raw pig's flesh, the animal having been slaughtered while ill. Two were made ill and one died, but postmortem on the fatal case was held too late to allow of bacteriologic search. However, from the smoked meat, a virulent proteus was isolated. That such smoking may have little or no effect on the virulence of a germ had been shown experimentally by the work of Beu and Forster,[30] who smoked and salted meats for varying lengths of time without any effect on germs in the interior of such meat. Fischer[21] found virulent Bacillus enteritidis in meat which had been smoked for seventy-one days.

An epidemic affecting eighty-one soldiers at Hamburg in 1900 was studied by Pfuhl,[31] who also found as the cause a virulent proteus. Alcoholic, ether and watery extracts of the meat were without effect, as was also subcutaneous inoculation. But feeding mice and intraperitoneal inoculation of mice and rats were effectual. From fed mice, one allowed to die, the other being chloroformed, a proteus identical with that in the meat was found. In man and in animals diarrhea but no vomiting was induced. Pfuhl mentions the fluorescing proteus isolated by H. Jaeger from some sausage producing fatal illness in Baden, also the isolation by Wyss, in a great epidemic of the fishes in Zurich Lake, of a proteus pathogenic for fish, mice, guinea pigs and cats, and we can readily imagine what would follow the ingestion of fish or meat infected in this way. Olmacher,[32] investigating some cases of poisoning due to eating oatmeal, isolated a proteus. Various other germs have been isolated from poisonous meat, the best account of which will be found in Vaughan and Novy's "Cellular Toxins."[2]

Among these are the cases reported by Kuborn where the Staphylococcus pyogenes aureus was attributed a causal role. Denys,[33] reporting eleven cases with one death following the ingestion of cow's meat, the animal having suffered from puerperal fever, isolated from various pieces of meat from this cow, in both aerobic and anerobic plates, cocci, whose colonies varied somewhat in color and also in liquefying power on gelatin. All were staphylococci, no other germs being found. The germs possessed slight but distinct pathogenic effect. Mice fed on the meat were not affected. Denys thinks the germ did not show any effect until its introduction into the alimentary canal of human beings. He considers the meat to have been infected before death, as all specimens of meat from this animal showed the presence of the germ. There was no abnormal color, odor, or taste, to the meat. The symptoms were malaise, nausea, and vomiting with diarrhea and great pain in the stomach. Prostration was marked. No cutaneous manifestations whatever. Convalescence was fully established in about a week.

My second class of meat poisoning cases are comparatively few in number, and it is to such cases that the term "Botulismus" should be applied, the cause being the germ isolated in 1895 by Van Ermengem and named by him Bacillus botulinus.

During that year at a funeral in Hainaut, Belgium, at the little town of Ellezelles, a number of persons ate of some ham which had been cured in brine; three deaths occurred, and in investigating these cases Van Ermengem[6] found in certain parts of the ham and in the spleen of a fatal case an anaerobic, powerfully toxicogenic bacillus, whose optimum temperature of 32° centigrade showed it to be a true saphrophyte. Only that part of the ham submerged completely in the brine proved toxic, and it was only from this anaerobic portion that Van Ermengem was able to isolate his bacillus. The toxin produced by this germ is a soluble one readily passing out of the germ into the surrounding medium, resembling in this respect the toxins of diphtheria and tetanus, and especially resembling the latter in its affinity for the central nervous system. After eating meat containing this toxin there may be slight or well marked gastrointestinal disturbance, but the symptoms on the part of the nervous system are specially characteristic and usually develop in one to three days. The pupils are dilated; blindness, ptosis, paralysis of tongue and pharynx with loss of voice may supervene. The secretions are suppressed, the muscles weak, and we may have convulsions, coma, delirium and death. Acute nephritis if often seen. These symptoms differentiate botulismus clearly from ordinary cases of meat poisoning where choleraic symptoms predominate, with little reaction on the part of the central nervous system. Van Ermengem has studied this organism very thoroughly, and since his publications[34-35] the same organism has been found by Römer[36] in pickled ham, by Lauk[37], Bail[38] and by Collatz[39] in 1905 in some bean salad, his cases presenting typical symptoms of botulismus and the germ being recovered from the salad in question.

As we have seen the enteritidis group is by far the most important factor in diseased conditions following the use of poisonous meats, and indeed some authors, as Babès,[40] even go so far as to assert that various conditions such as cholera nostras, paratyphoid, dysentery, enteritis, septicemias, hemorrhagic infections in man, Weil's disease, infective myelitis, et cetera, are due to germs primarily of animal origin and which have reached man through his food, drink, or in other ways. He mentions the fact that in several cases of apparent exanthematous typhoid, he and Busila isolated a proteus resembling very closely an organism isolated from sick fish by Babès and Riegler. Trautmann[41] goes a step further and declares that food poisoning is only an acute infection (toxin plus germ) with same essential factor as paratyphoid fever (germ alone).

The small epidemic that we investigated belongs in the first class, being in all probability a postmortem infection of meat by a pathogenic organism, in this case the Staphylococcus albus.

During the month of August, 1906, in Kalamazoo, Michigan, there occurred within a few days of each other nineteen cases of acute intestinal intoxication, the cases being distributed among some four or five families and all showing symptoms more or less alike. The symptoms developed within a few hours after eating the suspected meat and consisted in a rise in temperature to 100.2 centigrade to 102.5 centrigrade. Pulse was rapid. There was severe abdominal pain with vomiting and purging. Two or three of the cases developed muscular cramps, especially in the legs. One patient had convulsions lasting some forty-five minutes and was relieved by purging after that interval. Most of the cases after vomiting felt much better and had no further trouble. Two or three were ill for several days and one suffered with marked depression for over a week. Diarrhea was present, some of the attending physicians reporting the stools as reddish in color, others as very black. They did not attribute the color to blood, but no tests were made. There was no evidence of metallic poisoning of any sort. All the cases made a good recovery.

The board of health investigated the outbreak and found that in all the families where cases occurred dried beef had been served at the meal preceding the onset of the symptoms, and found moreover that the persons made ill were those only who had partaken of this meat. All the families affected had bought their meat from one butcher, and the health officers, satisfied that the meat in question was to blame, seized the part remaining in the shop and sent it to this laboratory for examination.

The meat was dried beef from the cut known as "inside round," and had been received by the wholesale dealer in a box with other pieces of the same kind of meat, the whole weighing about one hundred pounds. The meat was put up by a well-known Chicago packing house and was supposed to be government inspected, which should have precluded the packing of meat from a diseased animal. The meat was sold to various retailers, but among the customers of only one did any cases develop, pointing strongly to an infection of this particular piece of meat after it reached the hands of the retailer. This was further substantiated by the fact that the infecting germ was found principally along the fascia, the path of least resistance, while the deeper parts of the muscle layer were almost germ free.

When the meat reached the laboratory Doctor Novy fed bits of it to white rats without any effect. He also made beef-tea emulsions and gelatin plates of the meat. Intraperitoneal injection of two cubic centimeters of the beef-tea emulsion in white rats was fatal as were also injections of pure cultures of the organism isolated in the plates.

From the heart blood of the dead rats an organism was recovered, and this culture along with the meat was turned over to me by Doctor Novy, to whom I am much indebted for the privilege of investigating the matter. The meat was dried beef, perfectly normal in odor and in appearance, except for a slight greenish tinge in a few places, but such a change is often seen in healthy meat of this character.

Plates in gelatin and agar were made by cutting out bits of meat from the interior of the muscle parts with sterile instruments and also from deep in the meat following the line of the fascia. The plates were grown aerobically and anerobically and only in those made from material along the fascia did any appreciable number of colonies develop. In the plates from such places whether grown anerobically or aerobically, an abundant growth developed, in practically pure culture. The organism isolated corresponded with the one obtained a month earlier by Doctor Novy, except that its virulence was considerably decreased. Bits of the meat were again fed to white rats and to a small cat, but without effect.

From a study of the cultural characteristics we decided that the organism was a member of the staphylococcus group.

The germ was of a low grade of virulence and even after passage through eight or ten animals two to three cubic centimeters of beef-tea emulsion of twenty-four hours growth were required to kill a white rat in twenty-four hours on intraperitoneal inoculation, while three to five cubic centimeters sufficed to kill a medium-sized guinea pig. Five cubic centimeters made a rabbit quite ill but did not prove fatal, while a small cat withstood ten cubic centimeters, though very ill for some days.

All efforts at getting a soluble toxin by filtration of cultures through a Berkefeld filter were unsuccessful, and meat artificially infected with the germ and kept for varying lengths of time and then fed to rats and cats, proved harmless. Such meat was not putrefactive but had rather a pleasant acid-like odor. My feeding experiments showed results very similar to those of Denys,[38] who was unable to affect lower animals by feeding meat infected with staphylococci of low grade of virulence, and yet this same meat introduced into the human body produced a most violent reaction. Most probably in my cases, as in those of Denys, the germ might show a most marked effect on the delicate mucosa of the human intestinal canal without bringing about much change in animals.

SUMMARY.

(1) So-called "ptomain poisoning" in cases of illness due to eating meats is a misnomer.

(2) The poisonous character of the meat is due to one of two causes.

(a) Infection of the meat, antemortem, at time of death, or postmortem, by some specific pathogenic organism, the most common being members of the meat poisoning group of the colon family, varieties of the proteus and in rare cases other germs as staphylococci.

(b) Infection of the meat after death by a specific toxicogenic saprophyte, the Bacillus botulinus.

(3) Material suspected of causing ptomain poisoning should be submitted without delay to a competent bacteriologist.

(4) In most cases a bacteriologic and not a chemical examination will reveal the cause of the poisoning.

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SYPHILIS OF THE NOSE AND THROAT.

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Hereditary, primary, secondary and tertiary syphilis occur in the nose and throat. Hereditary syphilis occurs in two forms: the early and the late. The early form is more common and bears a resemblance to the secondary acquired type. The lesions found in the nose and throat are usually more intense and the symptoms more marked than in the acquired disease. Syphilitic manifestations may be present at birth, but usually the disease is not noticed until the second or third week after birth. The first symptoms rarely occur later than the third month. The characteristic snuffles is usually the first symptom noticed. It consists of a severe rhinitis with a watery discharge, which is very irritating and excoriates the surface in which it comes in contact. Later the discharge becomes very foul in odor, purulent, bloody, and when necrosis is present, there may come away shreds of tissue. The nasal obstruction causes noisy breathing, suffocative attacks, difficulty in nursing and in itself leads to malnutrition. Fissures occur at the angles of the mouth and the alæ. Mucous patches are found in the nose and throat, and a peculiar flattening of the nasal bridge is noticeable. The characteristic skin lesions are present, and the hair and the nails are affected. The voice is shrill, the child is restless, emaciated, poorly developed, and presents the pathetic picture that has been aptly likened to "a little, dried up old man with a cold."

Syphilis tarda, or late hereditary syphilis, is comparatively rare. In an article which I published in the *New York Medical Journal*, July 26, 1902, I reported three cases of the late manifestations of syphilis. In two instances both history and examination failed to show any previous evidence of the disease. The statements made in this paper are drawn largely from the former article. There has been much discussion as to whether it is possible for hereditary syphilis to remain latent for a number of years after birth, and finally be manifested for the first time during childhood, puberty, or even adult life. There are cases where the first symptoms were noted late, and where the history and physical examination failed to show former disease. In the majority of instances a careful search will reveal evidences of earlier lesions, but even if they are not found, one is hardly justified in saying that none have existed. The generally received opinion is that these late symptoms are not the first manifestations, but simply a recrudescence of the disease. The late manifestations are prone to attack the upper respiratory tract, and may, and often do, produce lesions which, in extent and seriousness, are comparable to the severe forms of the tertiary stage of the acquired disease. Latent syphilis seems to need some physiologic epoch to kindle into activity the virus which may have remained dormant for years; thus we find that these lesions often develop at about the age of puberty. It is a curious fact that females are much more prone to tardy manifestations than are males. The palate is the most frequent site of these lesions, but the nose, nasopharynx, buccal and lingual surfaces, or the larynx may be involved. The character of the lesions varies, but they conform closely to the tertiary forms. Ulceration, diffuse infiltration, and gummatous deposits are the ones most frequently met with, and later adhesions between opposing surfaces, cicatricial contractions, and marked deformities of the parts may be present.

The diagnosis is usually not difficult if the possibility of syphilitic disease is constantly kept in mind. A carefully obtained family and personal history, a thorough examination, a systematic exclusion of other possible lesions, and the therapeutic test will usually enable one to make a correct diagnosis. It is very important that a prompt diagnosis be made, as in some of the cases the deep ulcerative lesions run a very rapid course, and, if not promptly checked, produce a disfiguring deformity that persists through life, and may bring about, either directly or indirectly, a fatal issue.

I wish to cite again Case III, reported in my former paper, as I have had recently an opportunity to examine the patient.

A girl, aged fourteen years. No history of parental syphilis could be obtained. Both parents and three other children healthy. The patient has always had good general health, and her nasal breathing has been free until the present trouble. Six months before coming under observation she commenced to have obstruction to breathing through the right side of her nose. The obstruction gradually increased, but was unaccompanied by pain or constitutional symptoms. She was brought for treatment because of the obstruction, commencing deformity of the nose, and enlargement of the lymph nodes, just below the angle of the jaw on the right side. Examination revealed a red, globular tumor, of about the size of a pea, attached to the right side of the septal cartilage well forward. Just behind the anterior growth could be seen another globular tumor filling the nasal passage. There was bulging of the nose externally, corresponding to the right ethmoid cells. As the nasopharynx was filled with the growth it was evident that the tumor filled the whole nasal passage. There was marked swelling of the glands of the right side of the neck. The tumor in the nose was fairly firm in consistence, not painful, and did not bleed readily when touched. The glandular mass in the neck was not accompanied by any pain or tenderness. No ulceration was observed in the nose, and there was only a moderate acrid discharge. Her symptoms could all be accounted for by the nasal obstruction and the presence of the growth.

The diagnosis in this case was either a sarcoma or a gumma of the nose. By exclusion a diagnosis of syphilis was finally made. The patient was given ten grains of iodide of potassium three times daily and inunctions of a mercurial ointment. A slight improvement was noticed at the end of a week. The growth gradually melted away, the enlarged glands disappeared, nasal respiration through the formerly obstructed nostril was established again, the bulge over the ethmoid cells vanished, and in less than four months every vestige of the growth had disappeared without leaving a trace of its existence.

On November 8, 1906, I had the opportunity to examine this patient again. It was over four years since she was treated for gumma of the nose. There has been no return of the growth, and the nasal breathing is free. The mucous membrane over the septum, especially over its cartilaginous portion, has more connective tissue than normal, and there is a tendency to the drying of the secretions and to crust formation. The nasopharynx is free and the pharyngeal mucous membrane is healthy.

This case teaches the necessity of always bearing in mind the possibility of syphilis, and that we should hesitate before diagnosing a malignant tumor, and especially before advising a serious operation.

Primary chancres have been found in the nose, pharynx, buccal cavities, on the base of the tongue and epiglottis. Chancre in these situations may be mistaken for diphtheria, tuberculosis or malignant disease, but the clinical history and the objective signs ought to make a diagnosis easy. Primary tuberculosis of the nose and throat is exceedingly rare, and the secondary forms are diagnosed by an examination of the lungs and sputum. Malignant growths usually bleed, are accompanied by pain and rapid deterioration of the general health.

Chancre of the nose usually occurs on the cartilaginous septum, but may be found on the alæ. It sometimes resembles a furuncle, but the rapidity of the development of the furuncle soon excludes it from the diagnosis.

Chancre of the tonsil has been frequently observed. The crypts of the tonsil seem to offer a convenient place for the lodgement of the virus. It has the appearance of an indolent, inflammatory nodule with a hard, indurated base and reddish-grey, denuded surface. The ulcer has irregular margins, and is covered by a glairy secretion, or a pseudomembrane. There is dysphagia, local tenderness and sometimes pain. The submaxillary and the submental lymph nodes on the affected side soon become swollen. The primary sore subsides spontaneously in a short time.

The primary sores on the lips are similar to chancre in other regions of the body, yet they are often wrongly diagnosed, until the secondary symptoms make clear the nature of the disease. When the primary lesion is situated upon the lips, or in the throat, the eruption appears much earlier than when in the usual location.

The artificial division of record, into primary, secondary and tertiary syphilis, is confusing if the stages are taken as distinct phases of the disease. The development of the various lesions and the clinical course is so irregular that any arbitrary division often obscures the proper conception of the disease. Lesions ordinarily late are sometimes early, or in the malignant type the whole disease may run a rapid and destructive course. These variations are especially noticeable when they occur in the nose and throat.

The histologic changes in the tissues are not characteristic of the disease, which simply shows its protean nature, and its imitative character. The lesions of syphilis are similar in whatever portion of the body they are found. The modifications are due to the different structure, and to the degree of moisture or dryness of the parts attacked. The characteristic feature is a round cell infiltration and the formation of new tissue. The new tissue may be diffuse, or circumscribed, and because of the few blood-vessels which it contains there is a tendency to undergo coagulation necrosis. The earliest manifestation in the nose or throat is a hyperemia of the mucous membrane, which in itself is not a sufficient guide to make a diagnosis, but to the experienced it is often suggestive of syphilis. Rubbing the surface, the same as rubbing the skin, will increase the vividness of the tint. Following the hyperemia is the mucous patch. In its simplest form it is an infiltration of the epithelial layer with round cells, and an erosion of the epithelium. In a patient who is cleanly, and where proper treatment is given at an early date, the mucous patch soon disappears without leaving a scar. If, however, the disease advances unchecked the infiltration will extend to the deeper layers, there will be some breaking down of the tissue and an ulcer will result. As this ulcer heals there will be left stellate scar tissue, which is characteristic of the disease. The deeper the infiltration, the more the destruction, the greater will be the scar tissue remaining. Secondary infection with the ordinary pus producing germs will not only modify the appearance but will increase the destruction of tissue. We do not expect to get in the early stage the involvement of the deeper structures, but severe cases, especially if not properly treated, may give rise to destructive lesions early in the disease. Later we get gummata, which are lesions more severe in character, but not differing in nature from the earlier ones. They extend deeply and may involve any, or all, of the tissues in the neighborhood. Scar tissue is characteristic of the repair of these late lesions, so serious deformities often result from the contraction of the new formed connective tissue. Thus as we trace the pathology of the disease from the simplest infiltration of the mucous patch, through the ulcerative, gummatous and destructive phases we have to consider not different entities, but only different degrees of the same process, and according to the extent of the lesion we can measure, in a degree, the stage and severity of the disease.

Secondary symptoms of the nose and throat are very common. The syphilitic coryza, with its acrid discharge, is often seen, but in itself is not characteristic of the disease. Mucous patches occur in the nose but are usually not recognized; and condylomata and deep ulcers are occasionally found. Sore throat and mucous patches are regularly found as early secondary symptoms. An irritable condition of the pharynx or larynx lasting for several weeks, without an apparent cause, is very suspicious of syphilis. A congestion of the mucous membrane is the earliest manifestation and is often overlooked, although the peculiar tint, to an experienced eye, is of diagnostic value. The mucous patch soon develops and may be found on any of the mucous surfaces. They are slightly raised above the surface, rounded or oblong in shape, variable in size and surrounded by an inflammatory area. The surface has a grëyish-white appearance, as if lightly touched with a solution of nitrate of silver. Secondary infection of the mucous patch may take place with the ordinary pus germs; then the denuded surface will be covered with a thin mucopurulent secretion. As the secretion from the mucous patch is very contagious care should be taken to prevent the infection of others.

Tertiary lesions reveal themselves in many different ways, and the diagnosis is often obscure. This is especially so when the symptoms are modified, or masked by the presence of tuberculosis or malignant disease; for it is no unusual experience to find these diseases in a syphilitic subject. First of all, we ought never to lose sight of the fact that every disease which we observe may be influenced by a syphilitic condition. We should depend more upon our examination, and less upon the history and the social status of the patient. What we find is tangible, the history we obtain from our patients is problemental. Never allow the absence of a syphilitic history to influence us in the presence of objective evidence. The gummatous deposits are the characteristic late lesions, though they may occur so early in the disease as to be secondary in time, or may be delayed for two score or more years. They appear first as deposits of new tissue, and later they break down to form ulcers, which have ragged, moth-eaten edges, and are covered with a mucopurulent secretion. We have superficial or deep ulceration in proportion to the depth of the round-celled infiltration. Mucous membrane, cellular, muscular tissue, cartilage and bone, one after the other become involved and destroyed by this process; and as it heals dense connective tissue bands produce extensive deformities, so characteristic of the ravages of this disease.

In the space at our disposal it will be impossible to do more than to mention a few of the conditions which result from the disease. Among these are: destruction and deformities of the nose; perforation of the hard or soft palate, with more or less loss of tissue; cicatrical adhesions between the soft palate and the posterior pharyngeal wall; ulceration of the epiglottis and larynx. Severe and neglected cases of ulceration of the epiglottis and larynx cause extensive loss of tissue, which may include not only the soft parts, but the cartilages as well. Stenosis of the larynx results from cicatricial bands and fibrous deposits.

The treatment of syphilis of the nose and throat is the same as when other portions of the body are affected. The main reliance must be placed upon constitutional measures; and if they are thoroughly used early in the disease there will be comparatively little need of local applications. The nose and the throat should be regularly cleansed with an alkaline, antiseptic solution, and the teeth should receive special care. A three to five per cent solution of nitrate of silver is a useful application to the local lesions in the throat.

The deformities, adhesions and stenoses which result from neglected cases require surgical treatment. It is in these cases that the art and skill of the surgeon comes into play. Serious deformities of the nose can be remedied by plastic operations. With the nasal deformity there is usually more or less nasal obstruction. It is important to correct the obstruction because of its injurious effect upon the general health. No operation for the cosmetic effect alone should be advised if it does not provide also free nasal breathing.

Perforation of the hard palate, which allows fluids to enter the nose, can be relieved easily by the use of a dental plate. Adhesions between the soft palate and the posterior pharyngeal wall may be so extensive that only a small opening remains between the nasopharynx and the pharynx. This unfortunate condition interferes with breathing, speaking and swallowing; and is accompanied by an excessive accumulation of mucus in the nose and the nasopharynx. If the adhesions are dissected free there is a rapid recurrence of even denser connective tissue bands. Many schemes have been suggested to prevent the raw surfaces from reuniting. About two years ago I successfully relieved a patient whose nasopharynx was almost completely cut off from the pharynx by dense adhesions of the soft palate to the posterior pharyngeal wall. I passed a needle with a heavy suture through the adhesion about one-half inch from the existing opening, and tied off that portion. The suture gradually cut its way through the tissue, and cicatrization took place without the raw surfaces coming into contact. In a similar manner successive portions were tied off until the soft palate was free from the posterior wall.

Stenosis of the larynx, fibrous bands, or adhesions may necessitate serious operations. In some cases the difficulty of the breathing may necessitate an immediate tracheotomy. If fibrous bands exist they can usually be severed through the natural passages. One case, which I reported about ten years ago, of stenosis of the larynx following syphilis was cured by intubation. A small tube was used first, and gradually the size of the tube was increased until an adult tube could be introduced. Two years after the treatment no return of the stenosis had taken place.

One point in regard to the use of the iodides in syphilis of the larynx should be remembered. The iodides may cause edema of the laynx in those who have an idiosyncrasy towards the drug, so it is wise to start with a small dose and gradually increase the amount, at the same time observing its effect upon the larynx.

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LACERATION OF THE KIDNEY.

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When loin or flank is torn open exposing a lacerated kidney, as in gunshot wound, the treatment of the kidney is quite evident, but if the skin happens to be unbroken and the kidney torn the situation is quite different.

To determine the presence of a wounded kidney where the patient has no open wound is difficult. The character of the violence, the character of the distress should be thoughtfully studied. Blows over the kidney upon the side, back, or abdomen of the patient may cause laceration of the kidney and should excite apprehension if the case exhibits any signs of disturbance of pulse or respiration that cannot be accounted for by lesions of other organs.

The diagnosis then may be made by exclusion. Bloody urine may be present but oftentimes it does not occur owing to the fact that the wound does not open into the mucous lining of the kidney as in the operative cases of suture of the kidney in nephropoxy. Swelling in the region of the kidney deep behind abdominal muscles and sometimes of the lumbar region on the affected side is met. It is in proportion to the amount of hemorrhage, extravasation of urine, and response of the retroperitoneum to irritation. Time that has elapsed after the injury is a factor in the swelling and must be considered in relation to the degree of constitutional disturbance. There are doubtless numbers of cases of slight laceration of kidney tissue which give no serious disturbance of health during the progress of repair, and the seriousness of the case will depnd upon the quantity of hemorrhage and its degree of infection by the urinary excretion. If the urinary path is not torn so that urine mixes with blood in the tissues around the wounded kidney we need not look for serious systemic trouble, but if the contrary is true, there will be active reaction on the part of the patient. This will be indicated by pain, swelling, tenderness on pressure, and fever, with loss of appetite, sluggishness of bowels and sometimes intestinal obstruction.

It should be treated by active catharsis and incision of the loin just as soon as the condition can be determined; when, if the kidney is actively bleeding, it may be sutured and drainage with gauze and rubber tube employed to conduct away urine and serous fluids.

Doubtless serious consequences follow kidney lacerations because of delay in making the diagnosis—determining the actual condition. The more skilled one is in palpation of the normal kidney, the more learned he is in the interpretation of pulse, respiration, and temperature and in locating conditions by exclusion, the earlier will he discover a menacing laceration of the kidney and be able to treat it successfully.

Unfortunately, sometimes the kidney is not the only organ injured when the human body has sustained sufficient violence to lacerate the kidney. Spleen, liver, intestine, ribs, skin and pelvis are sometimes injured at the same time. But it must not be forgotten that the *kidney alone* is in the majority of instances the organ broken and torn, bleeding and leaking infectious urine.

Treatment other than surgical in cases with enough local lesion to create constitutional disturbance is of secondary consideration. Incision and exposure of the wounded organ are imperative. Recoveries may be expected in nearly all cases that are determined reasonably early, and operated upon promptly. Suture and drainage will depend upon the degree of injury. Large wounds of kidney will commonly require suture to control hemorrhage, and in very extensive and inflamed wounds the entire kidney may need to be removed.

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ORIGINAL ABSTRACTS.

SURGERY.

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AFTER TREATMENT OF LAPAROTOMY.

IN Volume V, Number II, of *Surgery, Gynecology and Obstetrics* is given a symposium of papers on the "After Treatment of Laparotomy." The authors are well known and successful surgeons and, while their views do not coincide, they all present reasonable grounds.

According to Byford, the dieting and catharsis before the operation contribute to postoperative atony. As a result of such atony adhesions of loops of intestines take place. As a result of adhesions the intestines become distended; and, as the result of the adhesions and distensions, a displaced loop of intestine may become paralyzed or kinked. However, if, after an operation, peristalsis is established early this danger of paralysis, et cetera, is eliminated, as is also the danger from the absorption of toxic or septic matter by means of the intestines.

Therefore, he stimulates the intestines to activity and by means that produce the least irritation. To do this a laxative is used, but if there is no voluntary bowel movement within twelve hours after the operation a high enema of glycerin and water is given every two or three hours according to the necessity. If, after twenty-four hours, the flatulence does not pass away, and there is no evidence of active peristalsis, an ounce of turpentine is added to the enema which is retained as long as possible. Between the enemas the flatus should pass freely, and laxatives and enemas are given until this is accomplished. This passage of flatus freely, he regards as the one sign of complete active peristalsis. The administering of laxatives is not at all necessary to the preservation of the patients' lives, but according to patients who had undergone a previous laparotomy in which opium was given for the pains, the convalescence from this last laparotomy in which laxatives were given was much more comfortable.

H. J. Boldt, in the same magazine, advises discretion in the treatment after operating, but is inclined to lean towards the idea of getting the patient out of bed as soon as the effects of the anesthetic have passed off. Of course in case of frequent vomiting, arrhythmic or rapid pulse, or high temperature, the bed is the place for the patient. It is safe and beneficial to let a patient out of bed as early after an abdominal operation as is consistent with her general condition, provided that the wound has been properly sutured in layers and a scultetus binder, made of oxide of zinc plaster, applied.

Large operations, in which the recovery of the patient was doubtful, showed gratifying results and great rapidity in convalescence, if the patients were got out of bed within twenty-four to forty-eight hours after the operation. This early mobility gives better assimilation of food, induces intestinal peristalsis earlier and thus prevents intestinal adhesions, and makes circulatory disturbances less likely, hence less danger of thrombosis and pulmonary disturbances.

Some patients, because of a possible peritonitis, or an oozing surface where adhesions will occur, are kept in bed with the head of the bed raised so as to obtain trunk elevation. By this means free vaginal drainage is also provided for. For other patients early rising from bed would not be desirable. To these he recommends light calisthenic exercise with their lower and upper limbs. For all patients after a laparotomy he believes early mobility is much more beneficial than compulsory rest in bed.

A. Lapthorn Smith thinks that the after treatment is not of as much importance now when an early operation is performed, the Trendelenburg used, the intestines handled less, and the operation performed with great speed, as it was before any of these came into practice. However, there are certain cases in which the after treatment is of great importance, and for these he has elaborated a set of rules.

Nothing is permitted to enter the stomach for the first twenty-four hours, except in cases of severe retching, when two or three tumblers of hot water with soda mint tablets dissolved in them are given. The intense thirst has been eliminated by means of copious draughts of water the day before the operation. In case of much hemorrhage, however, the thirst is satisfied by two or three quarts of normal salt solution in the peritoneal cavity, and by salt solution enemas, a cupful or eight ounces every four hours.

To quiet the vomiting either Vichy water or rhubarb and soda are given at least three times a day. Hot water may be given to the patients during the second twenty-four hours *ad libitum;* at the end of this time the patients are no longer thirsty or nauseated but are beginning to be hungry.

Light liquid nourishment may now be given, but milk is to be forbidden because it ferments very quickly and aids distension. Cream may be taken by the patient without any discomfort resulting. The diet may be increased day by day until at the end of the third week she is having full diet.

As to treatment of the bowels, which require careful attention, the patient should be in the hospital in bed at least forty-eight hours before the operation, except, of course, in case of emergency. The nurse can then have the intestines so emptied of food and gas that very little after treatment is necessary. Purgatives need not be given for the first two or three days; a soap-suds enema every morning will bring away the little gas present and increase the comfort of the patient. Large quantities of morphin are to be tabooed; usually all he gives is one-quarter of a grain immediately after the operation and another one-quarter late that night.

The most comfortable position, according to this author, is the patient lying on her side with knees drawn up almost to the chin. The Fowler position is used except when a large quantity of blood has been lost, when the head of the bed may of necessity be lowered to supply the brain with blood.

He believes that a three weeks rest in bed is very beneficial and insists, if it is at all possible, that his patients remain in bed this length of time. They are allowed to sit up in bed on the nineteenth, twentieth and twenty-first days, and at the end of three weeks they are allowed to sit in a chair and take short walks. He says that some of his patients have been up and around within ten days with no ill results, so that perhaps he has been erring a little on the safe side.

Doctor Baldy, in this same issue, seems to think that the after treatment is of not much importance if the patient has left the operating table free from sepsis, hemorrhage, and shock. In the after treatment, also, he believes in simplicity. The stomach should not be irritated with anything for the first twenty-four hours, consequently the thirst is quenched by enemas of hot water. At the end of the first day he permits his patients to change their recumbent position, and to have anything to eat they want.

The care of the bowels should be the same as for a healthy individual, that is, the sooner they are moved after the operation the better it is for the patient. Since a normal person feels better after a movement of the bowels, why would not a sick one?

He believes that a patient should be kept in bed at least for two weeks after the operation, not for any particular advantage in the healing of the wound but because of the complete rest the patient derives from her stay in the hospital. This rest does quite a little toward putting the patient in a condition to withstand the trials of her daily routine work. Making a patient get up within from twenty-four hours to a week he thinks is brutal and irrational.

The dangers of phlebitis from a long rest in bed are to his idea nothing, because in his search through the literature and his conferences with neurologists, the men who have to do most with a patient in the recumbent position, he has been able to find not a single case where the phlebitis was due solely to the recumbent position. F. B. W.

THE TREATMENT OF ACUTE GENERAL PERITONITIS.

Chandler, in *New York Medical Journal* for July 20, gives certain rules for the surgical treatment of acute general peritonitis. His treatment, with which he has had great success—thirteen operated cases with but one death,—consists essentially of the following measures:

(1) Prepare the patient after anesthesia, which should be produced by ether in all cases.

(2) Make a median incision always. Use the intestines gently while examining for lesions; if gas is present look for a perforation—high up in gastrointestinal tract if there is little or no odor, low down in the tract, usually the appendix, if the odor is foul. After finding trouble repair quickly; in fact he emphasizes speed as a great factor in the success of these operations.

(3) Never wash out the abdomen.

(4) Have ample drainage from the pelvis by means of a large drainage tube, with a wick of gauze, through the lower angle of the median incision, and, also, if necessary, by means of multiple drains through puncture wounds over kidney region or wherever needed.

(5) After operating keep the pelvis at an angle of at least 75° upright, with the patient sitting absolutely erect. By this means the infectious matter may gravitate early into the pelvis, where it may be removed through rectum or vagina.

(6) With patient in upright position in bed give large amounts of normal salt solution by rectum, doing this by means of a rubber catheter inserted about three inches into the rectum and attached to a fountain syringe. Several pints may be given in eighteen hours, relieving thirst, filling abdominal lymphatics with solution and not moving the bowels if given gently.

(7) Wash out stomach just before recovery from anesthesia, or immediately after, and do not feed by mouth for four days. After the first day feed by bowel every four hours, using egg water, liquid peptonoids, et cetera, one ounce of food with three of salt solution.

(8) Morphin is absolutely indicated after operation, and should be given hypodermically for a stimulant, and as an abdominal "splint." It should be the only heart stimulant used.

(9) With pulse at one hundred everything looks favorable, no attention being paid to temperature until after third or fourth day,

when, if it shows signs of suppuration, the pus may be drawn from the pelvis through vagina or rectum.

(10) Move the bowels on the fourth day with an enema of milk and molasses, equal parts, mixed and warm, repeating two or three times, if necessary, to get the desired effect. After the enemas have acted a cathartic may be employed. Then give the patient small quantities of fluid stuffs, paying no attention to a rise in temperature, but washing out the stomach and giving calomel in small doses or castor oil if the pulse becomes rapid. F. B. W.

GYNECOLOGY.

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SURGICAL TREATMENT OF TUBERCULOSIS OF THE KIDNEY.

Kelly (*Surgery, Gynecology, and Obstetrics,* Volume IV, Number III) reviews his extensive experience in the treatment of renal tuberculosis. The author has never seen a spontaneous or nonoperative cure of demonstrated kidney tuberculosis. Neither do specimens obtained by operation show, in the affected portions, any healing process which would preserve renal function. In extensive infections involving the ureter as well as the kidney, there is an associated tubercular cystitis. The disease presents extremely varying degrees of chronicity, from one to thirteen years in Kelly's series. Concerning the origin and development of the disease the writer states: (1) Tuberculosis of the kidney, not including general miliary tuberculosis, is always unilateral at the start. (2) Tuberculosis of the kidney is practically always hematogenous in origin. (3) Primary tuberculosis of the bladder is rare. (4) Although bladder tuberculosis cannot heal while there is a tubercular kidney above, it does respond to suitable treatment after a nephrectomy.

The operative treatment employed by Kelly may be briefly summarized as follows:

(1) *Nephrotomy* is indicated in "desperate" cases of pyonephrosis, or when both kidneys are diseased, or when the kidney is to be drained and later removed.

(2) *Partial nephrectomy* is advised by the author only in cases where nephrectomy cannot be done, such as bilateral tuberculosis or horseshoe kidney.

(3) *Nephrectomy:* Removal of the kidney alone is advocated when the ureter, bladder and opposite kidney are healthy. The operation should be done as soon as the diagnosis is made. If the ureter

is thickened in its whole extent it is best to remove it down to the bladder, as wound-healing is more rapid and vesical disease more amenable to treatment if the entire focus above the bladder is eradicated. The intracapsular method of nephrectomy is advised in cases of pyonephrosis requiring a preliminary nephrotomy.

Regarding the mortality of nephrectomy for tuberculosis, Kelly states that out of fifty-seven operations there were four deaths; or seven per cent. In tabulating cures the author has had reports from all his living patients. Urinary examination has been made in each case.

In conclusion, the writer condemns the waiting treatment of renal tuberculosis and advocates prompt and early operation. C. G. P.

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PEDIATRICS.

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SOME UNHEEDED PRINCIPLES INVOLVED IN THE DIETETIC MANAGEMENT OF INFANTS DURING HOT WEATHER.

PISEK (*Journal of the American Medical Association,* August 11, 1906) says before the management of infants, during the heated term, can be placed upon a scientific basis the principles on which such management should be based must be ascertained. The real progress that has been made in the treatment of summer cases has not been the result of specific medication or of specific feeding, but has come from close attention to diet and care. In speaking of the poorer results obtained in feeding in summer than in winter, Pisek says there seems to be many factors, but heat is the primary one. He shows the importance of body heat, humidity, and perspiration in their relation to artificial feeding in hot weather. Heat is an excretion of the body as much as urea is. Body heat is excreted by conduction, radiation, and evaporation. Sweating helps insufficient radiation, and sweating is influenced by the relative humidity. Humidity and air temperature must be considered in feeding cases. He concludes as follows:

(1) In warm weather keep a light woolen garment over the abdomen to prevent sudden chilling of the skin and consequent heat retention by suppression of perspiration.

(2) Bathe infants twice daily.

(3) Give plenty of cool, boiled water to drink, to replace that lost by evaporation.

(4) Pasteurize the food to retard its decomposition.

(5) If the weather is close or muggy, or the humidity is high, dilute the food to one-half with boiled water. In very humid weather,

with high temperature, discontinue milk altogether, and feed gruels until the humid condition is past.

(6) On warm, humid nights do not give milk feedings; because the humidity is higher at night than in daytime.

(7) For diarrhea give calomel or castor oil to eliminate decomposing food. Stop all milk feedings temporarily. If the air is hot, but dry, milk feedings may be resumed quite rapidly. If the relative humidity is high, feed gruels to reduce heat production and also to starve out putrefactive bacteria, and cautiously get back to milk feedings.

(8) Provide a circulation of air, as stagnant air soon becomes saturated with water vapor and no more perspiration can evaporate and absorb heat.

ORTHOPEDICS.

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RESECTION OF THE KNEE WITH THE OBJECT OF OBTAINING A MOVABLE JOINT.

Davis (*American Journal of Orthopedic Surgery* for April, 1907) reports the result of an operation upon a patient with complete bony ankylosis of all the bones of the joint. This patient was a female, twenty-three years of age, with the knee fixed at an angle of one hundred thirty degrees, the result of articular rheumatism three years before the operation. He reviews the literature, especially the reports of Murphy's work reported in 1905, and concludes with the statement that while the former did not resect enough bone that in his case too much was removed and that a happy mean will bring better results.

THE TREATMENT OF TUBERCULAR ABSCESSES.

Young (*American Journal of Orthopedic Surgery* for July, 1907) divides his patients into three groups according to the bacteriologic findings of each individual case. In the first he places those in which the fluid is sterile; second, those in which the tubercle bacilli are present; third, those which have a mixed infection.

Operative procedures for the first class consist in incision of the abscess, curetting thoroughly, and closing without drainage. For the second class he makes an incision down to the abscess, then cauterizes the skin and subcutaneous tissues with a Paquelin cautery, after which he opens the sack and curets it. The wound is then closed, leaving a partial opening for drainage, which is left in place forty-eight hours. After removal of drainage the external surface of the wound is washed but no internal irrigation or packing is employed. A firm compress is kept in place over the abscess. In the third class he incises and curets, washing the cavity with a one-per-cent formalin solution and draining for forty-eight hours. Daily irrigations of the formalin solution are employed, alternating every second week with bichlorid solution. In the treatment of sinuses showing the presence of tubercle bacilli, he curets and partially closes by suturing. I. D. L.

OPHTHALMOLOGY.

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PARINAUD'S CONJUNCTIVITIS: A REPORT OF TWO CASES.

KRAUSS (*Annals of Ophthalmology,* January, 1907) gives a carefully prepared report of two cases of Parinaud's conjunctivitis, and adds an interesting discussion on the etiology and history of the disease.

Parinaud first described this form of conjunctivitis in 1889, since which time but forty-six cases have been reported in the literature of the world. After giving a detailed history of two cases, the author adds the following description:

Parinaud's conjunctivitis, or infectious conjunctivitis transmitted by animals, as it is called by Parinaud, may be defined as an acute, noncontagious inflammation of the conjunctiva, characterized by the formation of granulomata, especially in the fornices, affecting usually one eye only, disappearing without permanent injury to the conjunctiva, and accompanied by simultaneous acute inflammation of the preauricular and other superficial lymph glands of the same side as the affected eye. The infectious agent is at present unknown.

The symptoms in the beginning are those of a mild case of unilateral catarrhal conjunctivitis. There is a marked mucopurulent discharge, which soon becomes watery. There is a sensitiveness to light, and the lids are adherent after sleep. Pain in the eye is rarely a source of complaint at any time. The vision is unaffected. Objectively there are present early in the disease a marked ptosis due to the swelling in the retrotarsal folds, and much stillicidium without involvement of the lacrimal sac. The bulbar conjunctiva is slightly injected, the cornea remains clear and the iris normal throughout the course of the disease.

In the palpebral conjunctiva, the characteristic large follicles, or granulomata, of various sizes and groupings are found, most numerous and of greatest size in the region of the fornix and retrotarsal folds. These follicles are at first small and translucent; in some cases they may be large, assuming great proportions, and of a yellowish red color, or greyish, especially at their bases.

After sloughing, the granulomata get smaller, beefy-red in color, and finally disappear without leaving a trace of their former presence. They may attack either the upper or the lower culdesac.

In spite of their formidable appearance, and their sluggish disappearance, the cornea and iris remain unaffected.

Simultaneous with the appearance of the ptosis, the preauricular gland becomes slightly enlarged, but soon assumes enormous proportions. Involvement of the glands behind and below the ear, the post-cervical, and later the inframaxillary glands follow. The preauricular glands are painful and tender to the touch, the others much less so.

As long as the acute inflammation in the gland continues, the temperature of the patient is elevated accordingly. There is danger of abscess formation after the acute symptoms subside.

Although the eye condition may steadily improve, the glandular inflammation and enlargement may steadily extend, showing that not only are the toxins carried into the lymphatics but also perhaps the toxic agent. The latter apparently reaches most frequently the preauricular gland, since this is usually the gland that becomes most tender and suppurates.

The etiology is still unknown. Parinaud supposed the cause was to be found in some infectious material transmitted from animals, especially horned animals. Nothing has as yet been found to directly corroborate this statement. Hoor, in his analysis of thirty-three cases of undoubted Parinaud's conjunctivitis, found in sixty-five per cent of the cases a possibility of animal infection, and in thirty-five per cent was unable to establish a relationship. More or less contact with horses was noted in both of the author's cases, in one of which the horse was stated to be diseased.

Granting that it is of animal origin, it is rather unusual for such an infection to confine itself to so few individuals, and the patient not be in turn infectious to his neighbors. An explanation along this line that seems to be tenable is that the infectious matter requires a specially sensitive individual, and that the majority of people are immune. As these animals are frequently seen in the streets it would seem otherwise that everyone is more or less exposed to infection, as the animal discharges become dried and are wafted about by the wind in the form of dust. Hoor believes that inasmuch as the presence of the little nodules that resemble microscopically the structure of the tubercle are the most frequent pathologic change that has been noted, it is still possible that this disease is an exceedingly benign form of local tuberculosis.

Parinaud's conjunctivitis is one of the most readily diagnosed conditions, from the fact that we have unilateral conjunctivitis with intense swelling of the retrotarsal folds, studded with more or less numerous granulomata of varying size and color, causing a marked ptosis, and accompanied by a comparatively small amount of secretion; associated with these symptoms is a marked enlargement of the more superficial lymph glands of the face and neck, especially prominent first and last, being the preauricular gland.

The prognosis is uniformly good, especially if recognized and treated. Many cases have recovered with practically no treatment, but the convalescence in these cases was tedious.

The treatment recommended varies from mild antiseptic washes only to destruction of the nodules with galvanocautery or caustics, or by excision and suture of the conjunctiva. The treatment adopted in the two cases recorded above was as follows: Mild washes of biborate of sodium and camphor water were given every three hours. Argyrol in a twenty-five-per-cent solution was instilled every four hours, and was continued in spite of the fact that the patients stated that it caused a burning sensation. Nitrate of silver in a two per cent solution was applied to the everted lids, and caused no unpleasant sensation, until the lids were nearly smooth. Ice compresses were applied to lids at frequent intervals. For the glandular swelling, hot compresses of lead and opium were constantly applied, covered with thick layers of raw cotton and oiled silk. Where there is evidence of the glands having broken down, an incision should be made to evacuate the pus and favor healing. The temperature was controlled and the pain lessened by the use of phenacetin and tannate of quinin ointment. Tonics of iron and iodin were given later.

CONJUNCTIVA ASTHENOPIA DUE TO GLARE.

R. H. Elliott, M. D., B. S., F. R. C. S., et cetera, Major, Indian Medicine Service (*The Ophthalmoscope*, January, 1907), claims to have arrived at the pathology of conjunctivitis caused by the glare from tropical or subtropical sun, Finsen light, and *x*-ray.

Signs and Symptoms.—"The patient complains that he cannot face glare, and that when he goes out in the sun during the day his eyes water and give him so much pain that he is afraid to leave his house if he can help it. The lids are involuntarily half closed by spasm, and whilst exposed to the glare, vision is reduced, often to such an extent that the patient cannot do his work, and fears lest he should be obliged to give it up and so lose his means of earning a livelihood. After he comes in to the shade of the house there is a great feeling of relief, but frequently some measure of pain continues. Often the eyeballs ache persistenly, and not infrequently points of steady pain are complained of in the head. These may be situated in the vertex, in the forehead, or in the back of the neck. If the patient is able to avoid glare for a few days, all his troubles may pass away for a time; and removal to a dull climate, such as that of Great Britain, at once relieves the symptoms temporarily, or even permanently. A subject of this affection is more apt to suffer from it if he has been some time out in the country than he is on first coming out, or on recent return from a furlough. So also anything which damages a patient's health increases his predisposition to an attack of asthenopia. This probably explains the fact that during the trouble muscæ volitantes are often bitterly complained of by the patients. In a large number of cases no error of refraction exists, and in many others the correction of an existing error is quite insufficient to remove the symptoms. The reduction of vision complained of is due entirely to photophobia, and disappears when the patient is examined in a subdued light.

"On everting the eyelids a slight amount of conjunctivitis is observed. This is seldom well marked, and is frequently confined to the retrotarsal folds, but it is the cause of all the symptoms, and is the pivot point of the case. In all doubtful cases it is necessary to expose the retrotarsal fold, and to examine it with the utmost care.

"The cases met with in India vary greatly in severity. Some merely amount to a little discomfort and inconvenience, whilst others are so severe as to torture the patient. I knew of one case which drove the patient to suicide, and I have met with two which threatened to unhinge the patient's minds."

Treatment.—This is comparatively simple, being confined to the relief of the slight conjunctivitis by simple astringent lotions. Stress being laid on the importance of thoroughly treating the superior fornix. The author reports four cases, all of whom recovered. He emphasizes the fact that the diagnosis lies in the exclusion of all other causes which might produce such symptoms.

In conclusion the author asks the following questions:

"(1) Why a certain form of conjunctivitis should produce a train of symptoms, which is certainly not met with, as a rule, in much more severe and common forms of conjunctivitis, and why it should produce those symptoms in a ratio out of all proportion to the severity of the apparent signs of the affection?

"(2) What is the causa causans of the conjunctivitis? In other words,

"What factor is there common to the strong sunlight of the tropics and subtropics, the glare of the snows of Russia and Sweden! the bright arc light used in the Finsen Light Institute at Copenhagen for the treatment of skin and other diseases; the *x*-ray light to which *x*-ray specialists are exposed for long periods daily; and the intense glare of a lighthouse?

"What is there in all these sources of light which is calculated to excite an inflammation of the eyes such as one never meets with in people exposed only to the subdued light of Great Britain?"

To the first question I have no answer ready.

As for the second, the only thing common to all the radiations mentioned is "intensity." Wave length of frequency will not fit, for the Rontgen rays have, so to speak, no wave length at all, being an intense thin pulse. Nor will the suggestion that the cause lies in the blue or ultraviolet rays help us, for these would not be richly present in the coast lights. I am, therefore, inclined to the view that in each case it is the intensity of the light alone which can be blamed.

LARYNGOLOGY.

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FOREIGN BODIES IN THE BRONCHI; THEIR SUCCESSFUL REMOVAL WITH THE BRONCHOSCOPE.

EMIL MAYER (*Journal of the American Medical Association*, November 10, 1906) reports five cases. Certain bodies may be left *in situ* for some time without producing symptoms immediately dangerous to life. The presence of a foreign body of a solid nature or one that has a tendency to swell, occluding the entrance of air into the lung below it and producing symptoms that gradually become more severe, should be considered as constituting an emergency case to be operated upon at once.

The diagnosis may often be fully established by auscultation and percussion, while the use of the Roentgen rays may not always be depended upon.

The author advises tracheotomy rather than direct bronchoscopy, as the majority of these cases are in young children with very small laryngeal orifices. A longer time is required by the direct method, and there is danger of injuring the laryngeal mucous membrane. A preliminary tracheotomy enables the operator to use a larger tube than would be possible through the larynx. The author advises that the patient be kept in a warm room to lessen the danger of pneumonia after the operation.

PROCTOLOGY.

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HEMORRHOIDS.

IN the *Medical Fortnightly* for June 10, 1907, Stauffer, of Saint Louis, reviews the history of hemorrhoids, and after dwelling on the distinction between the internal and external varieties, gives what in his opinion are the chief causal factors. He mentions excessive eating and drinking, associated with insufficient exercise and constipation, as the most frequent etiologic factors. The abuse of purgatives is also an important factor. He emphasizes the importance of a careful diagnosis, and insists on a rectal examination in all cases, refusing to treat patients who will not submit to examination. In speaking of the examination, he states that few instruments are necessary and that examination of the rectum should not be painful. In bringing the parts into view he has found the rubber dilator devised by Hirschman, of Detroit, of great value.

In discussing treatment he states that the reason that the large majority of those who suffer from rectal diseases in the United States today are treated by irregular practitioners, is due to the inability or refusal of the general surgeon to properly apply palliative measures. When operation is indicated, where local anesthesia cannot be employed, he prefers ether anesthesia. He insists, however, that anesthesia should be complete before beginning operation. The sphincter should be dilated slowly and evenly. As to the method of choice, he believes that excision with catgut suture would be the ideal operation if asepsis can be maintained. The clamp and cautery is indicated in Stauffer's opinion in the old relaxed cases, where contraction is much to be desired, for large amounts of cicatricial deposits follow the use of the cautery operation. He believes that the injection method has its place, and advocates the use of the stronger solutions of carbolic acid in preference to the weaker. The ligature operation devised by Salmon, and popularized by Allingham, consisting of dissecting up the pile from the mucocutaneous juncture before ligating, he commends as having the endorsement of most of the best proctologists today. He concludes by urging more attention to the postoperative treatment of rectal cases, and states no patient should be dismissed until the wounds are thoroughly healed.

NEUROLOGY.

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AND
IRWIN HOFFMAN NEFF, M. D.
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THE PARADOXIC REFLEX IN PARESIS.

ALFRED GORDON (*Journal of Nervous and Mental Disease,* July, 1907) has an article on "A Study of Reflexes of the Lower Extremities in Sixty Cases of Paresis, With Special Reference to the Paradoxical Reflex." Gordon's paper is founded on a personal study of sixty well-developed cases of paresis. His conclusions are as follows:

"The old triad of reflex phenomena, namely, exaggerated knee-jerks, ankleclonus and Babinski's sign, which we are accustomed to find in hemiplegia or in any other organic disease with a distinct degenerative lesion in the motor pathway, is here markedly dissociated. While the first is present in the majority of my cases, the other two are rare. Of the two more recently described reflexes, Oppenheim's is also rare, while the paradoxical is frequent.

"In view of the fact that the pathological studies of competent observers show a constant presence of motor fibers' lesion, and that the latter is in the majority of cases only very slight,—the rarity of Babinski's and Oppenheim's reflex, also of ankleclonus, and the frequency of the paradoxical phenomenon acquite I believe for this reason a valuable clinical significance." I. H. N.

IDEAS REGARDING INTRACRANIAL TUMOR.

William M. Leszynsky discusses "Intracranial Tumor and Its Treatment" in the *Medical Record* of July 13, 1907. The writer gives in a short paper some facts regarding brain neoplasms. The following are a few of the excerpts which are interesting: "The relief of intracranial pressure and the prevention of blindness is of paramount importance, and makes it imperative that the so-called decompresssive or palliative operation be performed without delay." They emphasize the now well established fact in the majority of the cases where there is a choked disc, if the operation is delayed until vision becomes seriously impaired optic atrophy and consequent blindness will result. The opinion of Spiller and Frazier (*Journal of the American Medical Association,* September 1, 1906) that "palliative operations should be performed early in every case in which symptoms of brain tumor are pronounced and before optic neuritis has advanced far," is given as a sound doctrine, and they say it represents the concensus of opinion of all experienced neurologists. The author gives, with comment, short clinical histories of five cases, supplemented by autopsical findings in three.

I. H. N.

DIAGNOSTICS.

FRANK SMITHIES, M. D.
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THE USE OF AMMONIUM OXALATE IN BLOOD-CULTURE TECHNIQUE.

Epstein (*American Journal of the Medical Sciences,* September, 1907) comments on the fact that in making blood cultures, according to the ordinary method, outside hospitals, coagulation frequently presents many difficulties to satisfactory work. Under existing conditions it is also impossible to distribute the blood collected to appropriate media. In cases where a small amount of blood can only be obtained the possibility of securing complete cultures is slight. To facilitate collection of blood at the bedside he suggests that it be received into test-tubes containing ten cubic centimeters of the following solution: Ammonium oxalate, grams 2; sodium chloride, grams 6, and distilled water to 1000 cubic centimeters. The solution is sterilized for twenty minutes at a time on three consecutive days, the proper allowance made for evaporation, is tubed, and then put away in the cold to be used as needed. Epstein suggests that the solution be freshly prepared about once in three weeks. *The method of procedure* in the making of the blood culture is as follows: About ten cubic centimeters of blood are withdrawn from the vein of choice; this blood is poured at once into the tube containing ten cubic centimeters of the ammonium oxalate solution, and shaken thoroughly. It does not coagulate and may thus be taken to the laboratory and culture media inoculated as desired.

CLINICAL CHARACTERISTICS OF THE OPHTHALMO-REACTION TO TUBERCULIN.

Aubaret and **Lafon** (*Gazette hebdomadaire des sciences medicales de Bordeaux,* August 4, 1907, and *La Province Medicale,* September 7, 1907) present the following classification of the reaction which occurs when tuberculin solutions are injected into the conjunctival sac, according to the method of Calmette: *First,* the "mild form," which is characterized by a slight, diffuse redness of the ocular conjunctiva and that of the inferior tarsus, with turgescence of the lymphoid follicles. The semilunar fold and the caruncle are involved. There is no pain, no lacrimation, but only a slight increase in moisture. The duration of the reaction is from twenty-four to thirty-six hours. Sometimes the reaction is distinguished with difficulty. In order to better apprecicate it one should compare the conjunctivæ covering the two lower eyelids. The lids should be turned back as far as possible, the folds of the conjunctivæ thus being straightened out and the internal angles and the caruncles being fully exposed to view. *Second,* the "ordinary form," in which the redness involves the culdesac and the nasal bulb. There is a secretion of mucopus. The conjunctival folds are obliterated. The duration of the reaction is from two to four days. *Third,* the "intense form," with very pronounced injection of the conjunctiva, but without pericorneal engorgement. There are abundant secretion of tears, photophobia and feelings of heaviness in the eyeball. The duration of the reaction is from five to six days. *Fourth,* the "markedly intense form," which is characterized by considerable tumefaction of the tissues, occasionally by chemosis and with palpebral edema. There is marked lacrimation with pains radiating over the forehead and into the region of the temples.

The authors have experimented with the tuberculin injections in a variety of ocular affections. Their list includes numerous ophthalmias, cases of tuberculous choroiditis, of episcleritis, of interstitial keratitis, and of dacryocystitis, but their results have been so much at variance that at present no definite conclusions can be drawn from them.

MYELOPATHIC ALBUMOSURIA—KAHLER'S DISEASE.

Brown (*British Medical Journal,* September 14, 1907) reports a case of multiple myelomata associated with albumosuria of the Bence-Jones type. The patient was a male Jew, aged fifty, who for some time had experienced general pains, which had become localized in the hands and the legs. He was anemic, had a diffuse bronchitis, with sputa occasionally blood-stained, containing pneumococci. Blood pressure was 120 millimeters; the pulse was small and regular. There were no swellings on any of the bones or at the joints when the case was first seen, but later, over certain thoracic areas of tenderness, there were felt hard nodules, firmly fixed to the ribs. In the right axilla, hard, movable glands were palpable. At the end of a month's time in hospital the patient died with evidences of pneumonia. No postmortem was obtained.

The urinary findings are of special value. The quantity was fair in amount throughout the entire course of the disease. The specific gravity ranged from 1010 to slightly higher. There was only a "trace" of albumin by the ordinary tests; on standing there was a heavy deposit of phosphates; the sediment showed granular and hyaline casts. The following method for the recognition of the Bence-Jones body was resorted to: The urine was filtered to remove the phosphatic deposit. The filtrate was neutralized and heated. A dense, sticky-white precipitate appeared. This was filtered off while boiling. The second filtrate, after cooling, was treated with nitric acid. At the line of junction of urine and acid the characteristic white ring appeared, which disappeared on heating and again appeared on cooling. This primary albumose was removed. Some of the albumin-free filtrate was then saturated with crystals of ammonium sulphate. There was a precipitate which was filtered off and dissolved in water. It gave a violet color with the biuret test. (Bence-Jones' reaction.)

In summarizing the case Brown lays special emphasis on the occurrence of myelopathic albumosuria in men in late middle life; on the period of weakness and the diffuse pains, which later become localized, with the appearance of tumor masses at the points of tenderness. He explains the sudden appearance of the tumor masses by the statement that the growth in the bone-marrow forces its way through the compact bony tissue. He ascribes the milky appearance of the urine late in the disease to the abundant phosphates. He is inclined to side with Parkes-Weber's opinion that the albumosuria is produced by the changes going on in the bone-marrow. The presence of a true albuminuria with casts may obscure the diagnosis for a time. The low blood-pressure should make one rather cautious in ascribing the changes to chronic interstitial nephritis.

MEDICOLEGAL.

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LAW, THE FOUNDATION OF STATE MEDICINE.

Doctor Samuel G. Dixon, of Harrisburg, Pennsylvania, Commissioner of Health of Pennsylvania, delivered an address before the American Medical Association on this subject. He said that the happiness of the people and the prosperity of the nation depended upon state medicine, for that nation would be strong which was vigorous in the health of its individuals. The contention that the enforcement of sanitary laws could be an infringement of personal liberty was puerile, for, as Parks has said, if we would aim to render growth more perfect, decay less rapid, and life more vigorous, we must give up many primitive or individual liberties. One factor in bringing about the wonderful achievements of the Japanese army was the high rank accorded to their medical and sanitary departments. In their particular branch of the service these men were supreme. In all great movements they were consulted. Unless a military necessity prevented, they supervised routes of march, sources of water supply, and sites for encampment. So long as the medical service was made subordinate to the strictly military service in our army, so long, the speaker said, would repetitions of the disgraceful slaughter of Camp Alger and Chickamauga be of common occurrence in our military operations. In all matters pertaining to the health of the troops the medical staff of an army should be the authority, and in all councils of war their voice should be of equal authority with those of the combatant officers. It was only the skill of the medical officers of our army that made the present occupation of Cuba by our forces possible without frightful loss of life. It was only their knowledge of the mysteries of the transmission of the Plasmodium malariæ and the yellow fever microorganism by mosquitos that had enabled us to undertake the construction of the Panama canal and to convert the Canal Zone from a valley of death into a region in which men could live and labor in health and safety.

Our legislators, Doctor Dixon said, were in general striving to do what was for the greatest good of the community in health matters, but they could not always distinguish between the true advisers and the false, between real scientists and pretenders, and the only way was for the Government to call upon educated medical and sanitary experts for advice; better yet it would be, if, as had been so often urged, there were established a Department of Health with a Secretary, a Cabinet officer, at its head. The keynote of state medicine was, however, compulsion and not persuasion. Without the law to back it, state medicine might be a beautiful science, but it could never be a practical art. Certain public health questions were of national concern, and such matters as the prevention of the pollution of interstate rivers and streams, the prevention of food adulterations, and the sanitation of public conveyances on interstate lines of travel, both by land and water, must be controlled by federal law. The author then spoke of recent sanitary legislation in Pennsylvania. The first noteworthy enactment was the substitution in place of a State Board of Health of a Department of Health with a single official at its head, having a seat in the Governor's cabinet. The same legislature which gave the commissioners such broad powers also placed under his charge all the waters of the state and laid on him the duty of reclaiming them from pollution. No new system of waterworks for the supply of water to the public, and no addition to a system already existing, and no new sewerage system or addition to a sewerage system already existing could be made without a permit from the commissioner, in whose office must be filed certified copies of the plans, surveys, and a description of such systems. Pennsylvania was until recently without a state system of registration of vital statistics, but this was now no longer the case. The legislature had passed an "Act for the Immediate Registration of Births and Deaths," and to make this law effective in the rural districts nearly a thousand local registrars and two hundred subregistrars had been appointed.

The speaker then referred to the scheme now being outlined in Pennsylvania for the limitation of tuberculosis. It contemplated utilizing the great forest reservations of the state for the purpose of hospital or sanitarium treatment. It was proposed to have two colonies at widely separated parts of the state. Instead of large and massive structures of brick and stone, there would be erected a large number of frame cottages, each of which would accommodate a small number of patients. Somewhat apart from these would be an infirmary for those in the more advanced stage of the disease. In this building those to whom hopes of recovery could not be held out would be afforded shelter and comfort in the closing days of life, and this extension of relief would be more than justified in the fact that such patients would be removed from their confined, crowded, ill-ventilated, and often impoverished homes at the time when they would be most in danger of communicating the disease to others. In addition to this, it was planned to establish in each of the sixty-six counties of the state a dispensary for tuberculosis, under the direct supervision of the Department of Health. The object of these dispensaries will be two-fold: Many patients who might be unable to leave their homes for a prolonged stay in a sanitarium could frequently go there for advice in regard to matters of diet, medication, and the open-air treatment, so far as it was possible of being carried on at home. They would also receive careful instruction in all the precautions necessary to be observed for the protection of others. In this matter of the care for the tuberculous and the limitation and prevention of the disease, the speaker hoped to see a generous rivalry between the states, so that each might deserve well of the republic.

Cincinnati, Grand and Nassau.

NUMEROUS MEDICOLEGAL NUGGETS.

FRENCH FEAR OF PHYSICIANS.

THAT the lawmakers of France distrust physicians is evident, and lest these worthies should be tempted to book their patients too quickly into the hereafter a law was passed to the effect that a medical man may not benefit under the will of a patient whom he attends in his last illness. This law may invalidate the will of Miss Susanna Margaret Coggers, a wealthy American lady, who recently died at Montpelier, leaving her large fortune to a local physician. Her two brothers have instituted proceedings to set aside the will but the physician claims as he was out of the city at the time of her death he does not come under the provisions of the law.

SELFISH JUROR REPRIMANDED.

At a recent coroner's inquest in a Pennsylvania town a juror indignantly protested against being made to serve on a coroner's jury thereby neglecting his business. The coroner consulting "Jervis on Juries" said to the indignant juror: "Upon reference to Jervis I find that no persons are exempt from service as jurors except idiots, imbeciles and lunatics. Now, under which heading do you claim exemption?"

GERMAN CURIOSITY.

The High Court of Germany has held that it is illegal for the physicians of any locality to band together and establish a definite code of fees for professional services. The court took the highly complimentary but unsatisfactory ground that physicians were actuated by a desire to benefit their fellows, and did not expect to be paid the full value of their services. They stood above the level of men in business pursuits, and the establishment of a fixed fee for their services would lower their dignity.

WANT OF LICENSE MUST BE SHOWN.

Legget versus Gerrick. The plaintiff, a doctor, brought suit against the defendant for professional services and got judgment for $100.00. Defendant asked for a new trial on the ground that it had not been shown that the doctor had a license to practice medicine in Montana. It was held by the Supreme Court of Montana that the law presumed that he had a license, in civil action, and that it was the duty of the defendant to prove the contrary if that were the ground of his defense. The judgment of the lower court was affirmed.

AN UNLICENSED PHYSICIAN MAY NOT PRESCRIBE HIS OWN MEDICINE.

The Supreme Court held that there was a difference between selling one's own medicine of which he is the patentee, and prescribing the same for the sick. The defendant was charged with unlawfully prescribing and furnishing medicines for the sick—with unlawfully professing to heal without first having obtained the necessary license. On appeal he contended that the indictment was insufficient because it did not charge him with prescribing medicines for human beings as distinguished from furnishing medicines to domestic animals.

BEER AS A MEDICINE.

Steiner, of Lincoln, Nebraska, was sentenced to pay a fine for selling beer. He defended on the ground that he had a druggist's license to sell spirituous, vinous, and malt liquors for medicinal, mechanical, and chemical purposes. The Supreme Court affirmed on the ground of the purpose for which he sold the beer.

INSINUATIONS ARE DANGEROUS.

An English druggist, or chemist, as they are called there, recently sold a proprietary remedy on application of the customer and attached thereto the following sticker: "*Caution*—Sold without our recommendation or responsibility, and supplied only upon this understanding." Suit for damages was brought by the manufacturer of the proprietary article. In the course of the trial the druggist said that he preferred to push his own goods to those of others, but was practically compelled to keep articles which were advertised as there was "a demand for them from the gullible public," on many of which, as in the present instance, he made very little profit. He admitted that had the extra two and one-half per cent discount for which he had contended been allowed the sticker would not have been used. The pharmacist was right in fact but wrong in principle. No self-respecting pharmacist will sell anything which he knows to be a fraud, but he should not keep the article on hand and should not fight it simply because of insufficient profit, for a higher reason is usually easily found.

INTOXICATION FROM CHLORODYNE SIMULATING ALCOHOLISM.

An English member of parliament used chlorodyne so freely for a griping pain that he became completely incapacitated, and his condition simulated so closely alcoholic intoxication that he was arrested and locked up. Brought to trial for drunkenness he was only released on medical testimony as to the fact of his having taken large quantities of the remedy and the close resemblance of its effects to alcoholic intoxication.

ANTICOCAIN LEGISLATION.

The new Whitney anticocain bill in New York provides that jobbers may not sell cocain or eucain to any except he be a licensed or registered druggist, physician, veterinarian, or dentist, which cuts off all sales to retail to consumers or to wholesale to peddlers and the like. Furthermore, the wholesaler must keep a special record of all cocain and eucain sales, giving the date of the sale, the name and address of the purchaser, the name and quantity of the goods supplied, and the name of the person making the entry. While some retail druggists are at fault it is no doubt true that the great majority of the habitues are supplied by peddlers; especially is this true of negroes who are very prone to take up this drug.

DESCRIPTIVE OR DECEPTIVE TRADE MARKS.

The patent office refused the application for the registration of the words "radium" or "radia" with reference to a liniment. There was no radium in the liniment. Radium was supposed to have a curative power and is of a very high price and was deceptive. The use of the words "iron" or "sulphur" in a trade-mark for liniment would have a meaning which is either descriptive or deceptive.

DOCTORS' BAD HANDWRITING.

AUSTRIA has issued an imperial rescript against bad handwriting in prescriptions. A druggist is forbidden to put up a prescription where the writing is, or any part of it, not plainly written, or about the interpretation of which there is the slightest chance for doubt or misconception. The rescript went into immediate effect and there was said to be a remarkable improvement in the chirography of the doctors, which would go towards indicating great adaptability or affectation. This order resulted from a mistake occurring in the prescription of one high in official circles in Vienna.

Cincinnati, Grand and Nassau.

EDITORIAL COMMENT.

DOCTOR OF DUPLICITY.

THIS decoration is created especially for the repeater. The foregoing sentence is not intended to convey the impression that reference is made to the repeating gun, but is calculated particularly to designate the repeating gue. Degrees are invariably evolved, generally earned and sometimes envied. The title contemplated in the above caption is an exception in measure, however, as the grudging is completely eliminated while the study necessary to procure the new-fangled appellation is pursued with a minimum expenditure of mental energy, but inasmuch as these considerations are offset by a maximum burden of humiliation, the doctorate will probably not be elected by the psychologically wise, notwithstanding the prevalent craze to possess a title.

As already stated, this article is not dedicated to the Marlin repeater but to the medical repeater. Occasionally some indiscreet individual, possibly with average scientific attainment but certainly with abundant supply of that hepatic product popularly termed gall, essays to achieve renown, albeit notoriety results, by contributing numerous copies of some article to various medical publications. An indiscretion of this kind was committed in Detroit awhile ago, the transgressor being Doctor Arthur E. Gue. Information gleaned from exchanges discloses the fact that the paper—"The Mechanical and Chemical Effect of Milk on the Human"—was dispensed to a score or more medical journals in different sections of the country, presumably with the distinct understanding that each periodical was accorded exclusive publication. The paper was tendered **The Physician and Surgeon** and courteously accepted, with absolute regard for the provision already mentioned. A grievance of the nature involved in this proceeding ordinarily furnishes just cause for provocation on the part of the editor deceived, but more especially is this the case when utter disregard for home sentiment is manifested by plying the deception on a publication conducted in such close proximity to the redundant litterateur.

An inborn longing for the limelight is undoubtedly the desideratum that prompts these repetitions. The advent of indexing bureaus certainly renders the practice inconsequential as regards the promotion of medical science. Prophylaxis is impossible of application since the process operates somewhat *a la* monte fashion. Although a paper may have the semblance of being dealt to an editor in good faith the author invariably has a duplicate in reserve which is doled to another, and so on *ad infinitum*. There are a number of thrifty repeaters abroad in the land, but suspicion never existed that one was incubating in this section. In nearly thirty years of medical journalism this is only the second time that the trick has been successfully worked on this sanctum. Original papers are accepted with the distinct understanding that contribution is exclusively to this journal. It is the aim of the editor to dispense pabulum which cannot be found elsewhere. Of course exception is occasionally made to this rule, as, for example, in the case of certain technical and scientific articles that appear in special journals and seem to require wider dissemination; abstracts of papers that cannot be assigned space for publication in entirety; official addresses before medical societies, et cetera.

In view of this rendering there is no palliation for this particular instance of duplicity. The act is clearly a breach of trust that is irreconcilable with ethical conduct, and no language is too caustic to employ in condemnation thereof. It is an act of meanness not only against editor but subscriber as well. Immediately following the civil war, a turbulent editor by the name of Kernan published a newspaper down in Dixie, the motto of which proclaimed to the world that "a reconstructed rebel is the meanest thing that crawls," but when this invective epithet was hurled against the relinquisher of the lost cause the repeater arraigned on this count had not yet begun to crawl. Webster seems to have anticipated the coming of this character, however, for the prophecy that gue is "a sharper; a rogue," is on record in the unabridged.

ANNOTATIONS.

ANENT SALIVARY GLAND ATROPHY.

ZAGARI reports an interesting and unprecedented case of death from atrophy of the salivary glands, which serves to illustrate the functional importance of these structures to the general economy. The patient was a female, fifty years of age, who suffered from continual dryness of the oral cavity, until salivary secretion entirely ceased. The effects produced on mastication and deglutition are patent. After the seventh month gustatory sensation on the anterior one-third of the tongue was negative, and despite the fact that digestion was fairly well performed and the patient continued strong, emaciation gradually ensued. To offset this condition cod-liver oil was administered with little benefit, and fearing syphilis, the investigator resorted to specific treatment without avail. Death ensued from marasmus in two years and four months. After much experimentation on animals Zagari concludes that the medulla is the seat of a *nucleus salivaris* and a *nucleus gustationus*. A lesion of syphilitic or parasyphilitic nature affecting the neuron, and through the chorda tympani acting upon the salivary glands, was responsible for the inhibition of salivary secretion, and the retarded internal secretion from the glands produced the bodily emaciation.

THE MICROBIOSIS OF CEREBROSPINAL MENINGITIS.

The bacteriology of cerebrospinal meningitis has recently been studied by Symmers and Wilson, excellent opportunity for the research being furnished by the late epidemic in Belfast. The meningococcus was determined in fifty-two out of twenty-five patients. The organism is Gram negative, produces indol, forms acid from glucose and maltose, but not from galactose. It does not peptonize gelatin, nor is it a gas producer. The most suitable medium for its culture is gelatin to which has been added raw ascetic fluid, although fluid sugar medium has given excellent result. The life of the artificial culture is of about two weeks' duration.

EFFECT OF BATHS ON THE VISCOSITY OF BLOOD.

Determann recently announced some further experiments on the viscosity of the blood which warrant application. While viscosity is due in greater or less degree to the number and volume of the corpuscles, to the amount of colloidal substance, and to the presence of carbon dioxid in the vital fluid, heat and cold are highly influential in increasing or decreasing the condition. After a number of experiments the investigator concludes that cold baths increase, whereas hot baths decrease resistance. In two cases wherein hand baths only were administered the viscosity was markedly lowered. The method is recommended in those cases which require immediate raising or lowering of the blood pressure.

MEDICAL NEWS.

THE CAREER OF DOCTOR CARRIER ABRUPTLY TERMINATED.

Albert E. Carrier, M. D., of Detroit, died suddenly at Saint Clair Flats, Michigan, July 4, 1907, heart disease being the cause of the sad event. The doctor was born in Cape Vincent, New York, May 16, 1841. He received his academic education at Gouverneur (New York) and Detroit, obtaining the degree of Doctor of Medicine from Bellevue Hospital Medical College in 1865. Immediately subsequent to graduation he practiced medicine in Detroit several years, but was forced by ill health to abandon this vocation, when he engaged in the lumber business with his father. He again entered the Aesculapian field in 1874, since which time he has not only become a prominent dermatologist in Detroit but has achieved distinction throughout the country in that specialty. He enjoyed connection with the Detroit College of Medicine as occupant of the chair of dermatology, and was likewise dermatologist to Saint Mary's Hospital, Harper Hospital, and the Women's Hospital. He was a member of local, state, and national medical organizations, as well as of the Fellowcraft and Wayne Clubs, and had received presidential honors in some of the medical societies.

The doctor was married to Irene S. Hibbard, of Detroit, in 1886, and of five children born of this union a son and daughter survive. The demise of Mrs. Carrier occurred some time ago.

The medical staff of Harper Hospital adopted befitting resolutions on the death of decedent, the following being an extract therefrom: "Doctor Carrier was a man of strong character and deep convictions, whose faith and creed were carried into all he did or said; a distinguished member of a profession which he loved and boldly served. As a teacher, he was thorough, and his utterances were marked by a clearness and forcefulness which left no doubt as to his mastery of the subject which he attempted to convey; as a physician he stood for all that was highest and best in his chosen field of work, and by attainment and personal effort ever sought to advance the welfare of his fellows and the cause of scientific medicine. As a man, his many excellent qualities endeared him to all who possessed his friendship: he was true and honest, and a Christian gentleman."

MINOR INTELLIGENCE.

Doctor Francis Peyton Rous, instructor in pathology at the University of Michigan, has returned from his summer's study in the Pathological Institute at Dresden.

Doctor Alvin R. Peebles, former second assistant in medicine at the University of Michigan, has resigned to take the position of associate in medicine at the University of Colorado.

Tulane University medical department is to extend the privileges of its curriculum to women, beginning with the next regular term, provided a class of ten can be registered by that time.

Doctor Hugo A. Freund, of Detroit, was recently elected to membership in the American Pathological and Bacteriological Society, in recognition of his work on trichomoniasis of the gastrointestinal tract.

RUSSIA is now in the throes of a cholera epidemic, twelve provinces being affected. The districts in the vicinity of the Volga are especially involved, and several Siberian cities have reported cases.

DOCTOR EUGENE S. TALBOT, of Chicago, professor of stomatology in the Illinois Medical College, was elected honorary first vicepresident of the International Stomatological Congress at its recent meeting in Paris.

THE freshman class at McGill University is considerably smaller than the classes of previous years. The changing of the course to five years and the recent destruction of the buildings by fire are advanced as causes for the decrease.

PROFESSOR MOSES GOMBERG's address on "The Life and Work of Liebig" inaugurated the work of the new year in the department of medicine and surgery at the University of Michigan. The address will shortly appear in this journal.

THE six Herter lectures will be delivered this year by Professor Ernest Starling, F. R. S., of London, during January. On January 11 he will lecture before the Harvey Society, of New York, on the "Chemical Control of the Body."

WITH the close of the session of 1907-8 the Barnes Medical College will become the medical department of the University of the State of Missouri. The work of the students already registered, however, will be continued uninterruptedly until their graduation.

JEFFERSON HOTEL, Richmond, Virginia, will be the scene of the annual meeting of the National Association for the Study of Epilepsy, on October 24 and 25, 1907. Addresses will be delivered by the Governor of Virginia and by the Mayor of Richmond.

DOCTOR CLARENCE WAGNER, of Toledo, and formerly a member of the surgical staff at the University Hospital, Ann Arbor, has been appointed director of the laboratory of the Phipps Institute, Denver, Colorado. Doctor Wagner begins his new work at once.

DOCTOR JAMES F. BREAKEY, assistant in dermatology at the University of Michigan, has been elected health officer of the city of Ann Arbor. He succeeds Doctor John A. Wessinger, who has rendered most efficient service during his incumbency in that office.

DOCTOR CHARLES W. EDMUNDS spent the summer in scientific investigation with Professor Arthur R. Cushny at the laboratories at University College, London, England. Doctor Edmunds returns to take the chair of pharmacology at the University of Michigan.

PROFESSOR WILLIAM F. BREAKEY, of the University of Michigan, attended the meeting of the International Dermatological Congress in New York, September 9 to 14. Professor Breakey read a paper on the "Need of Higher Requirements in Examinations in Dermatology and Syphilology by Medical Colleges and Licensing Boards."

DOCTOR WILLIAM PAGE HARLOW, formerly professor of hematology and physical diagnosis at the University of Colorado, and a graduate of the medical department of the University of Michigan, has been elected dean of the medical faculty at the University of Colorado.

PROFESSOR ALDRED S. WARTHIN, of the pathological department at the University of Michigan, was chosen president of the American Association of Pathologists at its annual meeting in Washington. The next meeting of the association will be held at Ann Arbor in April, 1908.

STATISTICS compiled by the British Board of Agriculture demonstrate that the English are becoming large consumers of meat. During the past few years the output of local butchers has nearly doubled, and the proportion of meat to bread in the daily dietary has markedly increased.

PROFESSOR R. BISHOP CANFIELD, of the University of Michigan, was married to Miss Leila Harlow, of Boulder, Colorado, in August. After an extended honeymoon tour through the Rockies, Professor and Mrs. Canfield have taken up their abode in the Cutting Apartments in Ann Arbor.

REGINA, Manitoba, has lately passed laws compelling vendors of bread to deliver same in specially oiled paper, and preventing the display of fruit by street-corner merchants. These precautions will undoubtedly aid in checking the dissemination of disease through the medium of dust.

DOCTOR DEAN LOREE has been appointed lecturer in genitourinary surgery at the University of Michigan. Saturday mornings are devoted to this work at the University Hospital. The special technique of cystoscopy and ureteral catheterization is demonstrated to small sections during the week in rooms adjoining the amphitheatre.

DOCTOR GEORGE L. STREETER, recently associate professor of neurology at the University of Pennsylvania, has been chosen for the chair of anatomy at the University of Michigan, The position was formerly occupied by Professor J. Playfair McMurrich, who resigned to take a similar position at the University of Toronto.

DOCTOR DAVID MURRAY COWIE, formerly instructor in pediatrics at the University of Michigan, has been elected to the chair of pediatrics at the same institution. The completion of the Palmer Memorial Ward at the University Hospital gives accommodation for about thirty children, exclusive of those quartered in the other wards.

AFTER investigating dairy conditions in and about the city of Washington, Secretary Wilson has concluded to ask Congress to authorize the Department of Agriculture to inquire into and supervise the interstate commerce in dairy products, particularly with a view to preventing the spread of tuberculosis and typhoid fever.

FLIES have been charged with causing the recent high morbidity among infants and children in Liverpool. The number of these pests has been unusually large this season, and hence the great contamination of foodstuffs partaken.

THE Minister of Public Instruction of France has sanctioned the establishment of a laboratory of animal psychology in connection with the National History Museum. The work of the laboratory will contemplate the investigation of mortality among animals, and will be in charge of Professor Hachet Souplet, of Paris.

SIR HENRY ALFRED PITMAN, who has just celebrated the one hundredth anniversary of his birth, claims the honor of being the oldest practitioner in Great Britain. He received his medical degree sixty-seven years ago, and since that time has been constantly connected with Saint George's Hospital, being still retained as senior consulting surgeon.

DOCTOR ROBERT B. BEAN, of the medical department of the University of Michigan, was married to Miss Adelaide Martin, of Baltimore, May 22. Doctor Bean has been connected with the laboratory of research anatomy at the University for the past three years, but has resigned to take the chair of anatomy in the Government Medical College, Manilla, Philippine Islands.

DOCTORS VAN ZWALUWENBURG, Walker and Howk have been appointed assistants in internal medicine at the University of Michigan. Doctor Van Zwaluwenburg will have charge of the out-patient department; Doctor Walker will devote his time to opsonic investigation and ward-class teaching; and Doctor Howk will instruct the senior class sections in clinical laboratory diagnosis.

AT the July meeting of the Upper Peninsula (Michigan) Medical Society, which was held at Menominee, the following officers were elected: President, Benjamin T. Phillips, of Menominee; vicepresident, Charles L. Girard, of Escanaba; second vicepresident, William T. S. T. Gregg, of Calumet; secretary, Harry J. Hornbogen, of Marquette. Marquette has been chosen as the place for the next meeting.

SAN FRANCISCO has experienced no less than fifty cases of bubonic plague during the past year, and the death rate from the malady has exceeded thirty. The unusual prevalence of the disease has prompted the State Board of Health to appropriate $1,500 as a fund with which to alleviate the condition. It is likewise the intention of the Board to establish a quarantine ship that bay and river craft may be fumigated.

THE chair of clinical professor in neurology at the University of Michigan, left vacant by the death of Doctor William J. Herdman, has been filled by Doctor Carl D. Camp, formerly instructor in neuropathology at the University of Pennsylvania. Doctor Camp is well known throughout this country and abroad for his scientific attainments, and will be a valuable addition to the University Hospital clinical staff.

RECENT LITERATURE.

REVIEWS.

ELECTROTHERAPEUTICS AND ROENTGEN RAYS.*

THIS is the title of a new book on that subject, by Mihran K. Kassabian, M. D., Director of the Roentgen Laboratory of the Philadelphia Hospital.

The first four chapters deal with the electrophysics of the subject, and are, as might be expected, largely a compilation from elementary text-books of physics and descriptions of electrotherapeutic apparatus. There is little that is new, and some things of questionable utility are described. The subject of cataphoresis is given little space—in keeping with its importance—while the chapters on electrodiagnosis and electrophysiology receive proper consideration. High-frequency currents and static-machine currents are dealt with both therapeutically and entertainingly, the latter more especially in some of the cuts.

Part II of the text—really the excellent part—deals with the applications of the Roentgen rays in diagnosis and therapeutics in a simple, concise, and practical manner. One finds much to commend, little to criticise, and many practical points.

The last two chapters deal with radium, radioactive substances and phototherapy.

The book is of especial value, not only to the student and clinician, but more especially to those who are endeavoring to come into possession of a good working knowledge of the use of electricity and Roentgen rays in a practice devoted more or less exclusively to these subjects. V. J. W.

*J. B. Lippincott Company, Philadelphia. Octavo; 600 pages. Illustrated in colors and black and white. Cloth, $3.50; half leather, $4.00.

THE PRACTITIONER'S LIBRARY: THE PRACTICE OF OBSTETRICS.*

As indicated by the title, this book is designed for the practitioner, and meets the requirements of such a work most admirably. In the text on practical obstetrics, we at once perceive that the authors are themselves workers in this field. In the task of illustrating, the editor has been most successful in his selection of appropriate cuts. We might find fault with a very few of the illustrations on the ground of repetition and actual unreality, but that would be hair-splitting criticism.

As would be expected, in a collection of monographs, we find a good many contradictions arising from difference of opinion on the part of the writers. In a book for practitioners these can be reconciled by an intelligent reader, whereas if used by students they would be regarded as confusing and inaccurate.

The subject of anatomy is well done by being omitted. In most text-books of obstetrics the chapter on pelvic anatomy reads like a student's examination paper and has as little value for the reader.

It is particularly gratifying to have in this book such a clear and complete chapter on the physiology and development of the ovum.

The chapters by Warthin, especially those on the pathology of the decidua, placenta, and membranes, are deserving of more than passing comment. They cover the field in a manner to be found in no other English work on obstetrics.

The physiology and pathology of labor and the puerperium are very well presented in a terse and practical way.

The subject of extrauterine pregnancy is indeed satisfactorily arranged and written. We rather disagree with the usual advice as to the need of immediate surgical intervention in case of rupture of the gestation sac. Salt solution infusion is not to be resorted to in every case of hemorrhage as the increase in blood pressure may cause a fresh outbreak of bleeding.

Under the heading of obstetric operations we believe that the dangers of the application of high forceps have not been sufficiently described; in fact the whole subject of forceps has been unduly abbreviated. Version and extraction are also open to the same criticism; especially is there a paucity of figures illustrating breech extraction.

Taken as a work, this book is a masterpiece in fulfilling its avowed purpose. It is decidedly a practical exposition of a subject in which all general practitioners should be specialists. C. G. P.

*In original contributions by American authors. Edited by Reuben Peterson, A. B., M. D., Professor of Obstetrics and Gynecology in the University of Michigan, Ann Arbor, Michigan; Obstetrician and Gynecologist-in-Chief to the University of Michigan Hospital. Illustrated. Lea Brothers & Company, Philadelphia and New York, 1907.

A STUDY OF THE HUMAN BLOOD-VESSELS IN HEALTH AND DISEASE.*

This book may be considered a monumental evidence of what can be done by a keen, devoted, and enthusiastic physician in the study of scientific medicine under adverse circumstances. It shows the possibilities for good, but also the tremendous disadvantages of the American method of advancing the knowledge of pathologic anatomy—in unsuitable rooms in hospitals or in private practice, in the hours stolen by busy men from other work, without time or chance for technical training or technical practice. The pity of it is that even now the vast majority of hospitals are still as unequipped for their work as the

Pennsylvania Hospital was when Doctor Meigs carried on his investigations so patiently and so persistently—*"inter labores et tædia,"* one may be certain. At the same time, it may be said that work like his doubtless inspired the beautiful Ayer laboratories now accomplishing so much in that fine old hospital, and that the example will in time have imitators.

It would be difficult adequately to review the work itself. In many respects the author's methods, as well as his views, are so original that comparisons are impossible and previous knowledge cannot be applied to test them. But on the other hand, there is a large fund of information of the most suggestive and stimulating character. Doctor Meigs deserves the thanks of all physicians and pathologists for putting his work in accessible form. The illustrations are numerous and of great beauty of execution. They are, however, so different from those we have become accustomed to, from cheap processes, that they require all the care their beauty deserves for their interpretation. The mechanical execution of the book as a whole is superior, and publisher, as well as author, are to be congratulated, as well as thanked, for its appearance. G. D.

*A supplement to "The Origin of Disease." By Arthur V. Meigs, M. D., Physician to the Pennsylvania Hospital. With one hundred and three original illustrations. Philadelphia and London: J. B. Lippincott Company, 1907.

DISEASES OF THE RECTUM: THEIR CONSEQUENCES AND NONSURGICAL TREATMENT.*

THIS little work consists principally of case reports from the author's practice, and purports to show the superiority of his "injection method of treating hemorrhoids" (with a secret preparation for sale by the author) to recognized surgical procedures. He quotes statistics from men not members of the organized profession, and in many cases ineligible on account of unethical conduct. The illustrations consist of instruments and appliances patented by the author or his father, and the whole tone of the book smacks of a personal advertisement. He concludes his work with an attack on the efforts of the organized profession to secure more rigid medical legislation. On the whole it is not much of an addition to scientific literature. L. J. H.

*By W. C. Brinkerhoff, M. D. 207 pages; cloth, $2.00. Orban Publishing Company, Chicago, 1907.

THE PRINCIPLES AND PRACTICE OF DERMATOLOGY.*

DOCTOR PUSEY has produced a work of superior merit, and a valuable addition to dermatologic literature.

The general plan of the book, the arrangements and order of subjects commends it to the general reader. The ample space given to the anatomy, histology, and physiology of the skin, abundantly illustrated, will appeal to the student. The gross and minute pathology—showing in the text the latest research in demonstrated facts—without cumbrous theories or speculative opinions, and greatly aided by an unusually large number and variety of illustrations, will render differentiation in diagnosis more easy and certain. Etiology and symptomatology are thoroughly considered, while the subject of treatment is sufficiently full and practical as to include most methods and measures found successful or helpful, as well as disapproval of those tried and found wanting.

It is as needless as it would be difficult to particularize in special points of excellence where the whole average of a book is so high; or, in a hypercritical way to pick out minor defects, which from some viewpoint may be found in every book.

It will be found a useful book to students and practitioners, and may be recommended as a safe guide in the care of dermal affections. It is needless to say the work of the publishers is also well done.

*By William Allen Pusey, M. D. D. Appleton & Company, New York and London, 1907. W. F. B.

ESSENTIALS OF OBSTETRICS.*

WHILE works of this kind have an undoubted value under certain circumstances, we believe that compends and abbreviated books should have little place in the teaching of obstetrics. General practitioners should be better obstetricians, consequently their education in this most important branch should be thorough and detailed. The student should be taught how to use the more elaborate treatise in an intelligent manner and to arrange for himself the essential facts. Later on, in practice, it is convenient to have short condensations for rapid reference. C. G. P.

*By Charles Jewett, A. M., M. D., Sc. D., Professor of Obstetrics and Gynecology in the Long Island College Hospital and Obstetrician and Gynecologist to the Hospital; Charter Member of the Congres Periodique International de Gynecologie et D'Obstrique; Fellow of the British Gynecological Society; Ex-Vicepresident of the American Gynecological Society; Ex-Vicepresident of the New York Obstetrical Society, et cetera; assisted by Harold F. Jewett, M. D. Third edition. Illustrated. Lea Brothers & Company, Philadelphia, 1907.

WHITMAN'S ORTHOPEDIC SURGERY.*

To the readers of the previous editions it needs no introduction. It is an established work, not only of the advancement of this branch of surgery in America, but of the author's place among its chief exponents. I. D. L.

*By Royal Whitman, M. D. Third edition. Cloth. Lea Brothers & Company, Philadelphia and New York.

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ORIGINAL ARTICLES.

MEMOIRS.

SOME PRACTICAL POINTS IN THE DIAGNOSIS OF RECTAL DISEASE.*

LOUIS J. HIRSCHMAN, M. D.

CLINICAL PROFESSOR OF PROCTOLOGY IN THE DETROIT COLLEGE OF MEDICINE; ATTENDING PROCTOLOGIST TO HARPER HOSPITAL.

When a body of medical men gather together in the middle of the hot summer season, as a rule they do so for purely social reasons, and to get away from everything which in the slightest degree smacks of "shop," and I take it that the members of the Monroe County Medical Society differ very little from the rest of the profession in that regard. One certainly does not care to listen to lengthy, deep, or ultrascientific discourses at this time of the year, and certainly not when within call of such a delightful resorting region as may be found around the beautiful city of Monroe. Therefore, the writer thought that, inasmuch as he was asked to present a short paper on some proctologic subject, instead of detailing operative technique, or report series of cases successfully operated upon, a few remarks on some practical points in the diagnosis of some of the diseases of the rectum more frequently met with, might be more acceptable to the members of this society.

In the daily work incident to the special field which the author has endeavored to cover, he is frequently brought in contact with patients who are the victims, not only of disease but of negligence, carelessness, or ignorance, I am sorry to say, of some of the members of our own profession. Patients suffering from rectal troubles are denied the right and privilege of having all the modern methods of diagnosis applied to them, more frequently than those suffering from most any other kind of disease. Why such should be turned off with a snap diagnosis of "piles" and a prescription for an ointment, without any further attempt to diagnosticate the exact pathologic condition causing the symptoms of which they complain, is more than the writer can understand. Yet it is a fact that for some strange reason or other, most physicians, who would not dream of treating any diseased condition of the nose or throat without an ocular examination; any gynecologic condition without both bimanual and specular examination; and would treat no renal disorder without making a urinalysis; or pulmonary complaint without calling to their aid auscultation and percussion, will diagnose and proceed to treat rectal symptoms without making first, a proctoscopic examination to ascertain the condition for which they are treating the patient.

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*Read before the MONROE COUNTY (Michigan) MEDICAL SOCIETY at Monroe Piers, July 18, 1907.

It is with a view of bringing before the members of this society a few of the commoner symptoms, which point to the rectum as their seat of origin and to lay some special stress on their significance, rather than with the idea of covering the field of diagnosis of rectal diseases in a short paper, that I present these few hastily written notes here today.

The more common symptoms which bring the patient to the proctologist are: Pain; hemorrhage; impeded fecal movements; or the reverse, diarrhea; tumors or protrusions; itching; discharge; or eruptions in the perineal region. Paradoxical as it may seem, I mention pain, the least frequent symptom, as first in the order of importance. I do this advisedly because of its absence in some of the most serious diseases with which we have to deal, and to emphasize the importance of its absence in these conditions.

Fissure in ano is the most frequent condition made manifest by pain. The pain is sharp, knife-like and most intense at, and immediately following, the passage of a hard stool. It is so severe at times that patients have fainted from it. On account of the dread of its excruciating character the patient will put off defecation for several days and then when he does have a movement, on account of the character of the retained stool, it is more severe than ever. This pain is out of all proportion to the size of the lesion which causes it, and when a patient presents himself with a history of pain like the above, accompanied by slight hemorrhage, which usually follows the stool, or is only noticed on the toilet paper, one should examine for fissure.

The pain caused by ischiorectal abscess is of an entirely different character. It starts on either side of the rectum and is more of a deep boring and throbbing character, growing with intensity, accompanied by a gradually rising temperature, and sometimes by chills. A dark brownish red swelling soon shows itself at one side of the anus, or a protrusion into the rectum is made out. If the abscess should rupture before surgical intervention, immediate temporary relief is experienced.

One should never attempt to open an ischiorectal abscess until the point of softening is made out by the examining finger, and the principal point to remember in treating such an abscess, is to keep it well open and draining by applying packing in such a way that it will be forced to granulate from the bottom up. Small marginal abscesses or thrombotic hemorrhoids or perineal abscesses due to infection of one of the hair follicles cause pain which is sufficiently localized, however, to make the diagnosis evident upon ocular inspection of the part.

The one other important thing to remember, however, in connection with this symptom of pain, is that in commencing malignant disease, in fact, usually in well advanced malignant disease, pain is absolutely absent. Extensive ulceration,—simple, specific, tuberculous or malignant,—may go on for months without the slightest pain being evidenced by its existence. When a pationt presents himself with a history of digestive disturbances, constipation alternating with diarrhea, or diarrhea which has been preceded and accompanied by flatulence and colicky pains, with or without slight rectal hemorrhage, and this sometimes continues for weeks, examine that patient's rectum at the earliest possible moment for commencing malignant disease. Do not let the fact that there is no loss of weight or any apparent interference with general health deceive you.

Commencing cancer of the rectum does not interfere with the apparent good health of the patient for some time. If the indican reaction is present in the urine it is another suggestive fact, for it is usually absent in ordinary diarrhea. Persistent diarrhea always should call for a thorough ocular exploration of the rectum.

Only last week a man, age forty-two, of Saint Clair, Michigan, was brought to me by his family physician with a history of a gaseous dyspepsia, starting two years ago, followed after several weeks by diarrhea, alternating with constipation, but without pain or loss of weight. He would have attacks of diarrhea, accompanied by some mucus and increasing quantities of blood, until the last few months, when he noticed increasing difficulty in defecation and more frequent and profuse hemorrhage. He consulted his physician, who made a digital examination and found a growth in the rectum. The doctor brought him to Detroit the very next day, and on examining him I found cancer of the rectum so far advanced that its lumen was nearly occluded. Here is a patient in apparently robust health today, weighing one hundred seventy-eight pounds, only forty-two years of age, suffering from malignant disease so far advanced that he has at most only a year or two to live. In having suffered no pain at any time, he believed himself suffering from a mild attack of "piles" and did not consider it necessary to consult a physician, and it is in just this class of cases that physicians are likewise led astray. The age of the patient, his apparent robust health, and absence of pain makes no difference. One may find cancer in childhood, as well as in old age, and it behooves every conscientious physician to insist on a complete rectal examination of every patient who presents any of the symptoms mentioned herein. As a matter of fact, I have seen fully as many cases of cancer of the rectum in patients below fifty as above. When one considers that fifty per cent of all cancers occur in the gastrointestinal tract, and that one of every six cancers of this tract are found in the rectum or sigmoid, one realizes the vital importance of an early examination of the rectum in all cases presenting symptoms as above outlined.

Besides malignant disease and fissure which have been mentioned, among the diseased conditions of the rectum and sigmoid, which present hemorrhage as an important symptom, are: Internal hemorrhoids; prolapse; ulceration of various kinds; stricture; polypus; proctitis; fecal impaction; chancroids and chancre; amebic dysentery; intussusception; embolism of the mesenteric artery; congestion of the portal circulation; scorbutus; foreign bodies; et cetera. For more extensive remarks on the diagnostic importance of blood in the stools, I would refer you to the paper on this subject, which I read at the last meeting of the State Medical Society and which will be published in the September, 1907, number of the *Journal of the Michigan State Medical Society.* There is so much to be said on this one symptom that I have only mentioned the conditions which are most likely to cause it, so that one may be on his guard when a patient with rectal hemorrhage, however slight, presents himself. One must remember that there are a great many diseased conditions of the rectum other than hemorrhoids, which give rise to bleeding, and it must never be taken for granted that the patient has, or has not, hemorrhoids until that patient is examined both digitally and with the proctoscope, and in the knee-shoulder position.

The various ulcerations of the rectum or sigmoid manifest themselves, not by pain, as has already been stated, but by diarrhea and hemorrhage. In fact, one might almost say that most cases of *chronic* diarrhea, not due to constitutional disturbances, are due to ulcer. The writer has repeatedly been able to diagnose and relieve the source of apparently intractable diarrhea, by the discovery, through proctoscopic examination, of rectal ulceration, the local treatment of which has accomplished the cure. Every time that I see a case of chronic diarrhea in consultation I find that the patient has not had a proper rectal examination, the attending physician not having considered it necessary or pertinent.

Ulceration of the rectum is the cause of a great many reflex symptoms. I have found it to cause gastric symptoms of all kinds, dysmenorrhea, bearing-down, shooting pains in the female pelvis, and simulating many gynecologic conditions. Ulcers of the anterior wall of the rectum are frequently the cause of irritable bladder, very closely simulating in some cases, cystitis and vesical calculus. I recall one case of a man, forty-five years of age, where, on account of the pain in the bladder, radiating to the end of the penis and down into the scrotum, together with other symptoms, a diagnosis of stone in the bladder had been made and operation decided upon. I was called into the case, because of the discovery of a few drops of blood with the stool, to make a proctoscopic examination. An oval ulcer about three-fourths of an inch in length and one-quarter of an inch in width on the anterior wall of the rectum was discovered, and on its relief the symptoms of stone vanished and the man became entirely well.

Shooting pains along the sciatic nerve and down into the heel, which have resisted treatment for sciatica, have been relieved by the healing of an ulceration on the posterior lateral aspect of the rectum, which was discovered on proctoscopic examination. Asthma has also been found a reflex from rectal causes in some patients.

Pruritus ani has been caused by ulceration within the rectum. Other cases of pruritus demand the most complete and thorough exploration of the entire rectal cavity. The only way in which this can be successfully done, is by air inflation with the patient in the knee-shoulder position, when the rectum baloons and every fold is opened when the entire surface of the mucous membrane of the rectum and sigmoid can be explored by the eye, aided by the electric headlight.

Many cases of pruritus which are not due to constitutional disturbances, such as diabetes; rheümatism; Bright's disease; hepatitis; alcoholic excesses; impeded feces; pediculosis, or dermatologic affections will be found due to irritable acrid discharge from diseased rectal crypts; from hypertrophied papillæ; proctitis; or rectal ulcer. The papillæ are found at the junction of the anus and rectum, and with the crypts encircle this point, giving a ragged saw-tooth appearance. These hypertrophied papillæ are frequently overlooked, or are mistaken for small tags of mucous membrane, or when greatly enlarged, for internal hemorrhoids. They are always more or less triangular in shape, the apex pointing downward and are never filled with the tortuous veins that distinguish the internal hemorrhoid. These papillæ found overlapping the openings of the goblet cells or Morgagnian crypts cause the retained secretion to become decomposed and irritating, so that when it finally is released, it sets up the troublesome system known as puritus ani, or so-called "itching piles." Fissure is a frequent cause of pruritus, as is the irritating mucous secretion of proctitis.

Constipation, probably the most frequent diseased condition which the average practitioner is called upon to treat, is as yet far from satisfactory in its results from medicinal treatment. Constipation in contradistinction to obstipation is a purely functional disorder. Obstipation is the mechanical obstruction of the fecal passage of one in whom the expelling forces are normal. When a patient gives the symptom of insufficient bowel movements, one must carefully enquire into the condition and should make a protoscopic examination to determine the cause. Obstitation may be due to hypertrophied rectal valves, stricture, prolapse, pressure from extrarectal causes, acute angulation at the rectosigmoidal junction, or resistant or hypertrophied sphincters. The use of cathartics, dieting and exercise may relieve temporarily all the cases, and a few permanently, but until the mechanical obstruction is relieved in obstipation, or the weakened circular muscular fibres of the large bowel in atonic constipation exercised and strengthened by internal massage, such as the author has advocated repeatedly before various medical organizations and in the medical press, permanent results will not be obtained.

The dilating rubber massage bag devised by the author has been proven, in the hands of over two hundred practitioners, to be a most satisfactory device for treating chronic constipation, and the reports from men who employ it are extremely satisfactory. In personal practice, not over five per cent of failures have been met with, and some of the cases have been suffering from constipation as long as thirty years.

Some of the symptoms which differentiate obstipation from constipation, are: an occasional desire to defecate, a feeling as if something were in the rectum or the rectum were packed; and the inability in spite of all straining efforts to accomplish defecation. Patients will tell you that they feel the stool coming down to the anus, but that they have not the power to expel it. They may also state that after considerable effort they pass a few small broken pieces, very hard and dark colored, or that the stool is ribbon-shaped, or in cylindrical form, narrow and very much flattened. The first part of the stool may be large, very hard and dark-colored, the passage of which is accompanied by pain, but the rest of the stool will follow easily and be of a normal character. The stool of constipation may be either a small, tightly compressed nodular cylinder or consist of many hard, dark-brown boluses. In constipation the patient has usually no desire whatever to go to stool, let alone the power to expel stool at the time. In cases of obstipation of long standing, constipation may also supervene. The bowel muscles become fatigued and atonic on account of the continued straining efforts at expulsion, which forces are opposed and prevented by mechanical obstruction lower down. Such a case would require for relief: section of the hypertrophied rectal valves; excision of the stricture or tumor; breaking up of the extrarectal adhesions, or dilatation of the resisting sphincter; in fact, removal of the mechanical obstruction. After this has been accomplished, then the bowel muscles must be massaged internally with the rubber dilator; the abdominal muscles strengthened by manual massage or mechanical vibration; the diet corrected; regularity of habits established and the proper exercise prescribed.

The various protrusions which one encounters in the anal region, are worthy of some passing comment. Of course, the most common protrusion is the internal hemorrhoid. Other protrusions are: Polypi; prolapsus ani; procidentia recti; intussusception and elongated hypertrophied papillæ. Polypi are usually of two kinds—a hard, fibrous variety, and a soft, spongy, strawberry-like polypus. The polypus, if it is situated low down and has a long pedicle, will be extruded with the stool. The soft polypus bleeds very readily. When the polypus is replaced, it goes back almost with a snap or jerk, and does not reappear until the next stool. Straining efforts, as a rule, will not bring a polypus down. Prolapsed mucous membrane of the anus or rectum differs from internal hemorrhoids in that it is velvety to the touch, of a more uniform red color, and is not nodular. It does not show the varicose venous radicals that characterize the hemorrhoid. Of course, not infrequently, hemorrhoids produce prolapsus ani, and the physician then has both of these conditions to deal with. When such is the case, hemorrhoidal tumors are very easily made out.

Procidentia recti differs from prolapsus ani in that all the coats of the rectum are extruded from within, while prolapsus ani consists merely of an exaggerated eversion of the anus. Occasionally when there is an abnormally long mesosigmoid, the sigmoid flexure is telescoped down into the rectum, and may protrude. On the insertion of the finger, however, a well defined sulcus will be made out entirely surrounding the protrusion, which can usually be replaced with the patient in the knee-shoulder position, with very little difficulty. Occasionally long ribbon-like tags will be found protruding from the anus, after stool. These are pinkish, or pinkish-red in color and will be found to consist of the long drawn out apices of hypertrophied papillæ. These are often mistaken for polypi.

Primary carcinoma of the anus is very rarely met with. When it is, however, it will be found to consist of a hard, dense enlargement at the anus, differing from an internal hemorrhoid in its density and its tendency to gradually enlarge, and to finally break down and ulcerate. It is accompanied by a characteristic odoriferous discharge and considerable discomfort. Irritable ulcer, which usually gives the same symptoms as fissure, presents a yellowish, or gray base, with one or more points of exquisite tenderness where nerve endings have been exposed by the ulceration.

Tuberculous ulceration of the anus is also rare, but when it does occur it is characterized by the constitutional symptoms of tuberculosis. It has a tendency to extend both inward and upward into the anus, and outward along the skin with undermined edges. This undermining is a peculiar characteristic of tuberculous ulceration.

Chancre of the anus, is, I think, not so rare as is generally supposed. I have seen two cases in the last six months. The characteristic Hunterian sore is found at the anal region, or just inside, is hard and leathery to the touch, is accompanied by enlarged inguinal glands, and other accompanying symptoms common to syphilis. Whenever one gets a history of a pus-like discharge from the anus, it is well to search for the opening of a blind internal fistula. This opening will usually be found in one or other of the posterior lateral quadrants, between the external and internal sphincter. It looks like a small papule, but by pressure with a probe, a drop of pus will be forced out, thus showing its true identity.

Another source of purulent discharge is rectal gonorrhea. This is accompanied by an intense proctitis, the rectal mucous membrane being red and swollen, and small pin-point ulcers are scattered over its entire surface. Where the sufferer has been a victim of pedasty, the anus will be found to be very easily dilatable, funnel-shaped, with relaxed sphincter. In the female, infection often results from contact with the discharge running down from gonorrheal vaginitis.

In complete fistula in ano, the external opening will be found either to one side or the other, usually posterior, and usually takes the form of a papule, from which, however, a drop of pus can be forced out. In examining such a fistula to determine as to its completeness or to find the internal opening, do not use a stiff probe, as it is very easy to force a false passage with such an instrument. Use a fine, solid silver, annealed probe. This is very easily bent or deflected, and will, when carefully handled, follow the fistulous track. The injection into the fistula of methylene blue, one to four solution of peroxid of hydrogen, or milk of magnesia, and watching through the anoscope for the appearance of the colored liquid in the rectum and noting the point of outlet, will often be of great service in making the diagnosis.

I find I am extending the time limit which I have set upon myself for this rather hastily prepared collection of remarks, and will conclude with the request that, if I have not made my points clear, that my auditors will not hesitate to ask questions regarding any of the subjects here presented and hastily touched upon.

Detroit, 604 Washington Arcade.

THE INDICATIONS FOR, AND TECHNIC OF, THE COMPLETE REMOVAL OF THE FAUCIAL TONSILS.*

MARSHALL L. CUSHMAN, M. D.
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WITH no idea of offering any new theories as to operative indication or suggestions for an improved mechanical technic, but rather to recall and emphasize certain well-known facts, I wish to speak on the indications for, and technic of, the complete removal of the faucial tonsils, and shall take as my text the following dictum of a prominent laryngologist: "Let us clearly understand one thing at the outset,—that a chronically diseased or enlarged tonsil is not only of no physiological value but that it is objectionable in itself and a menace to the safety of its possessor should he be exposed to almost any of the infectious diseases."

*Read before the WASHTENAW COUNTY (Ann Arbor) MEDICAL SOCIETY.

The indications for tonsilectomy are manifold but they may be broadly classified and described under two heads:

(a) According to the age of the patient.

(b) According to the pathological condition present, that is, whether the condition be one of simple enlargement, or a chronically infected state with purulent areas.

More detailed and complete classifications are, of course, common, but for clinical usage the above is quite satisfactory.

In children we find our commonest indication, and that in association with a generally hyperplastic condition of the structures comprising Waldeyer's ring, which in the following cases requires operative treatment.

(a) Where the tonsils are lare enough to obstruct free respiration. These cases are extremely common and are usually found in association with large adenoids, and present the typical facies of the mouth breather along with the malnutrition, facial and bodily deformity and impaired mentality, the so-called aprosexia, of this type. In these cases there is a marked tendency to disease of the ear, nose, throat, and lungs, as well as a lessened resistance to the acute infections; which fact alone is sufficient reason for their removal as a prophylactic measure. In such patients the improvement after operation is often startling, almost immediate gain in weight and improvement in the mental condition being the rule. Such children are usually anemic, and postoperative blood examinations soon show a higher red count and hemoglobin content. Of course removal of the adenoids should be done at the same time, failure to do this being the principal cause of the disappointing results obtained in the past.

(b) In cases of deafness or chronic suppurative otitis media, enlarged tonsils should be almost the first field for therapeutic attack, and frequently their removal, together with any adenoids present, alone results in a cure. Local treatment of the case, with this condition present, is often without result, and even should the discharge cease, recurrence is almost certain.

(c) In certain nervous disorders of children, especially those associated with the various tics or convulsive movements, enlarged tonsils should be removed as a possible source of reflex irritation. In these cases cure is by no means constant, but its frequency warrants the procedure.

(d) Cough is frequently a manifestation of a reflex irritation from enlarged tonsils.

The chronically infected or so-called "septic tonsil" is less common in children but may be seen in association with any of the above mentioned conditions and should, as in the following cases, be removed.

(a) In cases of recurring tonsilitis or quinsy the tonsil between attacks is usually seen to have infected areas, though it be quite small, and even though careful inspection fails to reveal any external disease, tonsilectomy is advisable, for it is a common experience in operating upon such tonsils to find large and deeply-buried abscesses, the danger of which is obvious.

(b) In cervical adenitis, either the tuberculous type or the simple recurrent form, the infection atrium is through the tonsil, the superior crypts being usually infected, especially in tuberculous disease, and tonsilectomy should precede any operative attack on the neck, the result being in the simple cases a cessation of the attacks, and in the others, closure of the infection atria, with a better prognosis as regards cure.

(c) Chronic "sore throat" associated with septic tonsils is less common in children but when present warrants the operation.

(d) Enuresis in children, though perhaps only one manifestation of an impaired mental state, is sometimes stopped by tonsilectomy.

In adults the simple enlargement is less common than in children and pathologically of somewhat different nature, but when present has the same operative indications. The infected type is more common, and besides the indications already noted the following are frequently observed.

(a) In pulmonary tuberculosis one frequently finds septic tonsils with demonstrable tubercle bacilli in the crypts, and if the general condition of the patient is good tonsilectomy is advisable as a part of the treatment.

(b) Toxemias, persistent and apparently idiopathic, are seen, that rapidly clear up after a tonsil operation, which frequently reveals hidden septic areas in the tissue. Headache is a common symptom in these cases.

(c) Mycosis tonsilaris, the infection from several varieties of the leptothrix, is best removed by operation.

OPERATIVE TECHNIC.

In selecting a technic for operating one should choose that method which is most thorough, for at present it is argued that nothing short of a complete removal of the tonsil within its capsule is satisfactory, and at the same time a procedure that is safe for the patient. The following operation is one that has been done in the Clinic of Otolaryngology at the University Hospital during the past year, and very well satisfies the above requirements.

The patient, if a child, is given a general anesthetic, or, if an adult, cocain, by infiltration and swabbing, and seated in the upright sitting position. The following instruments are required:

Jansen Doyen mouth gag.
Tongue depressor.
Vulsellum forceps (Ballenger model).
Allen septum knife.
Tonsil bistoury (Greene model).

After inserting the mouth gag the tonsil is grasped with the vulsellum forceps and pulled inward and downward so that the reflection of the mucous membrane from the superior tonsilar fossa is made tense. Then with the sickle-shaped Allen knife this is severed and followed down the anterior and posterior pillars, keeping always close to the tonsil but not cutting it. By rotating the vulsellum forceps inward the tonsil is gradually peeled from its fossa, the strands of connective tissue between it and the fascia of the superior muscle being cut with the Allen knife until only the base remains attached by a mucous membrane connection. This is severed with the bistoury, and if the previous dissection has been carefully made the tonsil is removed intact, surrounded by its capsule.

The operation offers the following advantages:

(a) Thoroughness, the tonsil being completely removed.

(b) Simplicity, both as regards few instruments required and ease of performance.

(d) Safety. Hemorrhage, the greatest danger in the operation, is very rare. As only connective tissue and mucous membrane are cut the vessels close quickly and easily.

THE UNITED STATES PHARMACOPŒIA AND THE NATIONAL FORMULARY.*

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ADJUNCT PROFESSOR OF MATERIA MEDICA IN THE DETROIT COLLEGE OF MEDICINE.

THE United States Pharmacopeia first appeared in 1820 and has been revised every ten years since. An association with members chosen for each revision, consisting of representatives of medical colleges and medical societies, pharmaceutical colleges and pharmaceutical societies, and delegates from the medical branches of the army and navy, and from the Public Health and Marine Hospital service, meets at Washington at decennial periods and takes up the task of revising the work. The aim of this undertaking as expressed in the governing regulations is as follows:

"The particular objects and business of this association are the encouragement and promotion of the science and art of medicine and pharmacy by selecting by research and experiment and other proper methods, and by naming such materials as may be properly used as medicines and drugs with formulas for their preparation; by establishing one uniform standard and guide for the use of those engaged in the practice of medicine and pharmacy in the United States whereby the identity, strength, and purity of all such medicines and drugs may be accurately determined, and for other like and similar purposes; and by printing and distributing at suitable intervals such formulas and the results of such and similar selections, names, and determinations among the members of this association, pharmacists and physicians generally in the United States and others interested in pharmacy and medicine."

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*Read at a joint meeting of the WAYNE COUNTY MEDICAL SOCIETY and the DETROIT AND WAYNE COUNTY RETAIL DRUGGISTS' ASSOCIATION, April 1, 1907.

At the last revision of the Pharmacopœia the average adult dose of the drugs treated of was for the first time included in the work. At this time also the strength of the more important tinctures was fixed at given standards.

From what is here given it will be seen that the United States Pharmacopœia is a sort of blue book brought out by physicians and pharmacists through their representatives to supply important and reliable information on subjects in which both are virtually interested.

The National Formulary first appeared in 1888. It is the work of the American Pharmaceutical Association. By way of explaining in a general way the nature and object of this work, it may be said that beside the remedies the Pharmacopœia contains there is a large number of other remedies and preparations, which are prescribed by physicians, in which among other things uniformity of strength and appearance is an absolute necessity. The meeting of this demand is the aim of the National Formulary.

Like the Pharmacopœia the National Formulary is also a blue book for physicians and pharmacists. With the exception of newer remedies not established the two works under consideration contain everything needed for the scientific prescribing and preparing of drugs.

While the objects sought to be obtained from the United States Pharmacopœia and the National Formulary are in the main those described above, the chief consideration that has been held in view in developing these works has been a desire to increase the effectiveness of the treatment of the sick. Those most directly interested in this laudable purpose beside the patient are the medical practitioner, the retail druggist, and the manufacturing chemist.

These three elements, it may be said, constitute a working force that accomplishes satisfactory results only when they constitute a harmonious whole. Absence or impairment of any one of the elements of this combination must render the efforts of the others practically impotent. In a word, each is dependent on the other. The prescribing physician, however, is the person on whom the greatest responsibility rests when it is a question of deriving from the United States Pharmacopœia and the National Formulary the benefits these works are capable of bestowing. He must take the initiative in utilizing them and keep always in mind that benefits will be secured in direct proportion to the frequency with which they are consulted.

The truth of these statements would probably be disputed by none, yet, for all this, it is safe to say that physicians as a rule do not use these works to the extent their importance demands. The reasons for this condition of affairs are doubtless many. Among these reasons mention may be made of the following: The mystery and magic that enveloped the practice of medicine in its earlier days, though they have been gradually disappearing for centuries are not yet wholly dissipated. The laity to a considerable degree, and the medical profession, at least in some quarters, to a lesser degree, like to delude themselves with the idea that drugs as remedies must be possessed of mysterious properties in order to be efficacious. As a result physicians thus afflicted choosing their remedies are apt to pass over the well-described drugs of the Pharmacopœia and Formulary to take up with others the action of which is so little known that plenty of room is left for mystery or almost anything else. Secret or semisecret curealls, proprietary or otherwise, constitute the main supply of remedies to which these physicians have recourse.

Again there are those that seem to be impressed with the idea that they are treating their patients and themselves best when they prescribe a drug or preparation of drugs that bears an unusual and not well-known name. As a result the Pharmacopœia and the National Formulary are passed by, while drugs and preparations with high-sounding but meaningless names, regardless of whether or not their real nature is known, are eagerly seized upon and utilized.

A third class of physicians that neglect to use the works under consideration may be described charitably as easy-going, and actually as indolent. These persons find it a much simpler matter to scratch on a prescription blank somebody's petroleum invigorator or somebody's hydroantiseptine, even though they know nothing or next to nothing of the actual constituents of the preparation prescribed, than to make up by themselves a prescription from official sources, or to search out and copy from the Pharmacopœia or National Formulary a formula the value of which is indicated by the nature of its constituents instead of by the terms of an advertisement or the oratory of a traveling agent.

The bulk of those that do not consult the United States Pharmacopœia and National Formulary do, however, employ official remedies, but get their information from works on practice, therapeutics and materia medica. On this account the proportion of physicians that use nonofficial remedies, though large in numbers, is not so great as at first glance would seem to be the case.

Taking it as a fact now that the United States Pharmacopœia and National Formulary are neglected to a greater or less extent by the medical profession, and that injury is done to the cause of scientific medicine in consequence, the question naturally arises, can anything be done to remedy the situation? The ansewer to this question is that much can be done for this purpose. In the first place students of medicine always, and physicians frequently, can be enlightened as to the real worth of these works. In addition, early and late, in season and out, here, there and everywhere, the great principle can be promulgated that in any and all circumstances injury is done to all concerned when, in treating the sick, the prescriber is ignorant of what he prescribes. Let the person that is prescribing insist on knowing what he is prescribing and he will turn to the United States Pharmacopœia and National Formulary as naturally as the banker turns to the multiplication table. And when this has been done benefits will follow in natural sequence. The semipatent medicines will lose much of their vogue by reason of the lessening of the number of those that prescribe them, while the real patent medicines will be used in a lessening degree by reason of the extension to the laity of the idea that the whole subject of prescribing drugs or preparations of unknown nature has become obsolete and of interest only as an historical study.

In addition to these benefits the retail druggist and the manufacturing chemist will have their work simplified and put on a more scientific basis, the physician will have his field of usefulness extended, the whole subject of prescribing drugs will be placed on a higher plane, and, most important of all, the sick will derive benefits from their treatment with more certainty than has been the case since the practicing of the healing art has had a place among the activities of men.

Detroit, 559 Jefferson Avenue.

THE DISPOSITION OF THE APPENDICIAL STUMP.*

BENJAMIN MERRILL RICKETTS, PH. B., M. D., LL. D.

THIS subject is dealt with from two viewpoints.

First.—The consideration of the various methods of disposing of the stump.

Second.—The cause of hemorrhage and its frequency.

In response to circular letters sent to a number of surgeons, sixty-four replies were received, representing 80,251 appendectomies, with an average mortality of seven and one-half in acute and one and three-quarters per cent in chronic cases.

Eighty per cent of the total number of operations reported have been done by the four purse-string methods.

The number of acute and chronic cases were about equal in number. The various per cents of different techniques used is given; also the per cent of cases in which the different ligatures and sutures of catgut and linen were used.

About sixty cases of hemorrhage from the stump are mentioned, forty of which are tabulated in detail, giving eleven deaths.

Of the total number of hemorrhages mentioned all but one have resulted in the purse-string methods.

The technique of each of the sixty-four surgeons is given briefly. Investigation of this subject shows that many operators have abandoned the purse-string methods; that others are doing so; that simple ligature for the firm and extirpation for the soft appendix are the safer methods; and that any other than simple ligature and extirpation with linen or silk for ligature and suture should be condemned absolutely.

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*Abstract of a paper read before the MISSISSIPPI VALLEY MEDICAL ASSOCIATION at the Columbus, Ohio, meeting, October 8, 9 and 10, 1907.

There are five illustrations showing the vascular supply to the cecum, appendix, and mesocolon, and thirteen giving the various forms of technique.

Cincinnati, Fourth and Broadway.

WILLOUGHBY DAYTON MILLER.

NELVILLE SOULE HOFF, D. D. S.
DEAN OF THE COLLEGE OF DENTAL SURGERY OF THE UNIVERSITY OF MICHIGAN

[By Courtesy of *The Michigan Alumnus*]

In the death of Willoughby Dayton Miller, Ph. D., D. D. S., M. D., Sc. D., which occurred at the Newark, Ohio, Hospital, July 27, 1907, not only the Dental Department and the University, but the dental profession of the world, suffered the greatest possible loss. Professor Miller had just returned to this country from Germany, where he had practiced for many years and had been honored signally by the German Emperor, to take up his new duties as Dean of the Dental Department of the University. His death followed an attack of heart failure, preceded by an operation for appendicitis five days before.

The news of this sudden removal from a sphere of great activity, and of devotion to his beloved profession, will be a great shock to his many friends and admirers and bring a sense of incalculable loss to the dental profession throughout the world, as he unquestionably was the foremost scientist in his profession, and was just entering upon a new career of great importance to the profession of this country.

W. D. Miller was born August 1, 1853, near Alexandria, Licking County, Ohio, where his parents lived on a farm, which is still in the possession of the family and where he always spent his vacations when in this country. When he was twelve years of age his parents removed to Newark, Ohio, about ten miles distant from the farm, and he entered the public schools of that city and prepared for college. After he was graduated from high school in 1871, he entered the University of Michigan that fall and took his degree of Bachelor of Arts in June, 1875. While in college he devoted himself especially to mathematics and physics. Upon his graduation he decided to adopt as his profession that of mathematical physics, and went to Scotland and entered upon a course of study in the Edinburgh University under Sir William Thomson. He spent one year there, and then went to Berlin, Germany, for further preparation. Here, through overwork and study, his health gave away and he was compelled to stop his labors to recuperate, and it was during this enforced period of rest that he found his life's great work in a most unexpected way.

At this time Doctor F. P. Abbot was the representative American dentist at Berlin. He had married the daughter of a former American minister to Switzerland, Mr. Theo. S. Fay, and his home became well known to all Americans sojourning in the German capital. Doctor Miller was a frequent guest at the home of Doctor Abbot and became acquainted with his older daughter whom he afterwards married. Through his intimate acquaintance with Doctor Abbot, Doctor Miller became interested in the chemical aspects of the dental art and made some researches for the doctor concerning tin and gold fillings. These so greatly pleased Doctor Abbot that he induced Doctor Miller to return to America and take the dental course, where he was graduated from the University of Pennsylvania in 1879. He returned to Berlin and took up the practice of dentistry and began the study of bacteriology with the famous Professor Koch.

From this time on he entered into the scientific work of his profession with all the zeal and enthusiasm which were so characteristic of the man, and which made him in due time the foremost dental scientist of the world. He continued a devoted student and at the same time carried on a large practice. He soon began to give the results of his scientific researches to the profession and thus entered upon a public career that involved a great demand upon his time and physical resources, so much so that he was once compelled to stop all work for a period of two or three years, and give his time to recuperating his health.

In 1884 he was made Professor of Dentistry in the University of Berlin, the highest honor that could be conferred upon him. It is said that a German Professorship had never before this time been conferred upon a foreigner. In passing it is interesting to note that this act of the German government made Doctor Miller a German citizen, although he never took out German papers of citizenship, and consequently when he resigned his professorship in the fall of 1906 to accept a professorship in the University of Michigan he lost his German citizenship, and became an American citizen again; or what is really the better way to put it, the German Empire lost an official subject.

Doctor Miller began contributing his work in 1881 through the dental societies. His first paper of importance was read that year at the annual meeting of the American Dental Society of Europe, at Wiesbaden. This was soon followed by a series of contributions to the *Independent Practitioner,* a dental journal edited by Doctor W. C. Barrett, of Buffalo, New York. These papers were upon the subject of the etiology of dental caries, and were received with much adverse criticism since they propounded a new theory as to the cause of dental caries. They resulted, as is well known to his own profession, in the establishment of the present theory as to the cause of this disease which is now universally accepted. The work done on this subject at once established Doctor Miller's reputation as a scientist, as it was thorough

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WILLOUGHBY DAYTON MILLER, '75, Ph.D., M. D., D. D. S.

APPOINTED DEAN OF THE DEPARTMENT OF DENTAL SURGERY IN 1905.—DIED JULY 27, 1907.

and faultless. From this time on he has been a constant contributor to the literary and scientific, and to a considerable degree, to the technical work of his profession.

In 1887 Doctor Miller took the "Rigorosum" examination for the medical degree in Berlin University. This is the most exhaustive of all examinations in this university, and he passed it with the predicate of "*Magna cum Laude,*" and a record of fourteen out of a possible fifteen points, the next highest record obtained by anyone at that examination being eight. As a result of this examination, Doctor Miller's position in the Berlin University and in the minds of the German dentists was made secure, as the government had been severely criticized before for retaining on the faculty a foreigner, and many attempts were made to have the Minister of Education replace him with some German dentist. At the time of his leaving Germany, all prejudice had disappeared and the German dentists did all in their power to persuade him to remain and complete his work in Germany. It is reported that there was no one man to whom the German dentists were more loyal than to Doctor Miller, and American dentists practicing in Germany strongly opposed his return to this country, as he stood between them and the efforts continually being made to discredit their legal standing by German practitioners. His wise counsel and known integrity as well as his kind and generous disposition made him the most influential member of his profession in Europe. He was not only honored for his work and attainments, but he was universally beloved for his personal character, and there will now be many sad hearts where he was best known. Doctor Miller had had a great number of honors conferred upon him. He was an honorary member of thirty-seven different professional organizations; the University of Michigan conferred upon him the honorary degree of Doctor of Philosophy; the University of Pennsylvania the degree of Doctor of Science; the Fourth International Dental Congress at Saint Louis in 1904, bestowed upon him a gold medal for a paper presented there entitled "A Study of Certain Questions Relating to the Pathology of the Teeth." He had many other honors of which we are not sufficiently informed to speak. At the time when he was considering the question of leaving Berlin for Ann Arbor, the German Emperor conferred upon him the very honorable title of "Kaiserlicher Geheimer Medizinalrath," or "privy medical councilor to the Emperor."

The faculty of the University of Michigan has for many years cherished the hope that some day it should have the help of Professor Miller in carrying out its plans of making Ann Arbor one of the best places of dental learning in the world, and when three years ago in a private conversation the writer learned that he was desirous of returning to this country that he might complete some work here for his profession that he very much wanted to do and which he could not well do in Germany, steps were immediately taken to bring him back to this country and to the University of Michigan. Professor Miller came to Ann Arbor and conferred with the Dental Faculty and University authorities and finding that the work required of him was so heartily in accord with that which he wished to undertake, and that the University was so willing to accord him the facilities for accomplishing it, he was persuaded to sever his relations with Berlin, in spite of the great pressure made in Germany to dissuade him. Friends, colleagues, dental societies and the highest government officials by their appeals made it difficult for him to leave the place he had so long and acceptably filled for a new and unknown field. As was characteristic of the man, although a rich merchant of Berlin offered to build, equip and support for him a complete dental research laboratory, if he would stay in Berlin, he decided to come to Ann Arbor because he could here do the work he believed most needed to be done. Perhaps nothing can be said that would better illustrate the unselfish devotion of the man to his profession than to say that the work he planned to do here was of such a nature that it would probably not have added a greater honor to those already conferred upon him, but it would have contributed immensely to the future welfare of his profession, and this he considered much more important than any personal emolument or renown.

The idea that inspired Doctor Miller in recent years was to find some way by which the decay and loss of the teeth might be prevented, one that could be universally applied and which, especially, should be within the means of the people who are unable to pay for the present surgical methods of treatment. With this in view the last three years of his life were spent on an exhaustive research of the present mouth toilet preparations and prophylactic methods. He had but just begun this work and it was his purpose to continue this research until he could determine whether there was any chance of finding a solution of this problem in that direction. So far his work has thrown much light on the injuries resulting from the misuse of the tooth brush and injurious abrasive tooth powders, and has created a new interest in the chemical causes of wasting of the tooth structure. It was Doctor Miller's plan to continue this research and he had great hope that he would succeed in adding something of value to preventive methods, or at least that oral hygiene should be more scientifically practiced by the mass of the people than it now is.

There has been much comment both in this country and in Europe on Doctor Miller's decision to leave the land where so much of his life has been spent and where he had done the work that has brought him so many honors. It is commonly supposed that it was his great love for his own country, and the natural desire that seems to come to all men to get back to the home of their kinsfolk and their places of birth that led him, in spite of the many strong inducements to remain, to sever his relations with Berlin and come to Ann Arbor, where the work and environment would be new and problematic. But Doctor Miller was a wise man and he looked into the future farther than most of us. He realized that there is a great work for the dental profession to do in the near future, and that so far as he could see there was no adequate preparation being made to meet the demand which is to be made for men who are competent to take up this work and do it scientifically. He saw that at Ann Arbor the means and material could be had for the development of scientific workers such as few other places offered. When called to accept the office of Dean of the Dental Department of the University of Michigan he made his acceptance contingent on a promise that he should be provided with suitable facilities for developing this line of work. This the Michigan authorities gladly agreed to do, and the new building is now under way. It was his idea that he could select from the students passing through the school such men as he might be able to influence, and prepare for scientific study of the various dental problems.

He was greatly interested in the advancement of the dental educational standards and he hoped to be able to do much for the cause of higher standards in this country through his connection with the University of Michigan. He believed that the dental standards should be as high as the medical, and had well defined plans as to how this could be accomplished. He believed in the education of dentists as such and had little sympathy with the idea of a complete medical education as a foundation for the practice of dentistry. At the same time he strongly favored maintaining the instruction in the medical sciences so far as they had a value in equipping dentists for their practice, and for this reason he wanted the entrance requirements for a dental course brought up to those of medicine.

His last work was an address which he prepared for the annual meeting of the International Dental Federation, of which he was president. In this address he sets forth his views of this important question.

This brief statement of the life and work of this great man will in some measure help us to estimate the tremendous loss we have sustained in his death, at a time when he could have done so much for his profession and humanity. If his life shall stimulate others to take up the work with more earnestness we shall long have the benefit of his influence in making our profession of great usefulness to the world.

Those who knew Doctor Miller intimately speak fervently of his goodness of heart. He was naturally a modest man, but a man of very strong affection, and was devoted to his family. He was an active supporter of the American church in Berlin, and gave his time and resources to it in the same lavish manner with which he devoted himself to his scientific work. He lived a true Christian life, and up to the last he gave evidence of the Christian faith and a firm belief in the life hereafter. He was a strong man in every way, and his loss to the world at this time is great and lamentable.

Doctor Miller leaves a widow and three children, the oldest, a son, is a medical practitioner in Berlin; a daughter, whose husband is W. G. Cady, is professor of physics in Wesleyan University at Middletown, Connecticut, and a younger daughter about thirteen years of age. Mrs. Miller will probably make her home with her daughter in Middletown, Connecticut.

ORIGINAL ABSTRACTS.

SURGERY.

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AND
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EXPERIMENTAL WORK ON THE ABDOMEN.

THE abdomen has of late years been considered a rich field for experimental work, and not a few of these experiments have been helpful though some of the questions remain unsettled.

Here is one by J. W. Draper Maury, M. D., of New York (*Annals of Surgery,* Volume XLVI, Number IV): "Is death in high intestinal obstruction due to the absorption of bile?" He cites the fact that acute intestinal obstruction occurring in the duodenum or oral portion of the jejunum is more rapidly fatal than when it occurs beyond this point, and quotes from M. Wilms, that all patients probably succumb to toxic absorption, resulting from the decomposition of intestinal and stomach contents, though he does not mention the possible retention of biliary and pancreatic fluids in producing this effect. Boszeky and Genersich believe that bacteria and their toxins pass through the intestinal wall, interfere with the vagi and splanchnics and cause congestion of the abdominal organs with anemia elsewhere.

The writer made a closed gastroenterostomy upon several dogs and noticed that under certain conditions an invariable train of symptoms occurred, tetanic in form, which ended in death. One condition consisted in cutting and closing a short duodenal loop. If this portion of the loop was less than thirty-five centimetres from the pylorus, the animal invariably died before the gastroenterostomy opening was formed (seventy to one hundred hours). To prove that a fatal termination was not due to decomposing food, the experiments were repeated upon fasting animals with the same result. To show that disturbance of innervation at the pylorus was not the cause of death, the pylorus and a small amount of the stomach was resected and inverted, care being taken not to injure the bile duct, and a closed gastroenterostomy was performed. All of this series of animals lived until the opening was established (seventy to one hundred hours).

Meltzer and Salant found that contrary to the prevailing opinion bile contains a tetanic element or an agent which causes increased excitability of the nervous system. Opie found that bile introduced into the pancreas caused death of the animal in twenty-four hours or widespread damage of the gland according to the amount injected.

The conclusion reached is that death in high obstruction is due to absorption of toxic elements of the bile which are normally harmless by dilution and colloid suspension in the secretions of the small intestine. If further experiment and observation should prove this statement true, the early treatment of such cases of obstruction may be modified accordingly to give favorable results.

* * *

Another article by Edwin Beer, M. D., and Carl Eggers, M. D., of New York (*Annals of Surgery,* Volume XLVI, Number IV), is an affirmative answer to the question "Are the intestines able to propel their contents in an antiperistaltic direction?" There are two groups of observations which help to solve the problem—one laboratory, the other clinical. After reviewing the work of other experimenters to the present time with affirmative and negative proof, they proceed to give the result of their own experiments, some twenty in all. The work was done upon dogs. Segments of large and small bowel were reversed and connected again by end-to-end or lateral anastomosis from fifteen to twenty-five inches in each section. Some weeks later (eleven to fourteen) the abdomen was opened and repeated examinations showed that peristalsis was passing down the reversed portion when the bowel was irritated. The same change was noticed in the large as well as the small bowel. Longer sections are difficult to manipulate because the upper end of the anastomosis is apt to break and the animal dies.

The clinical evidence bearing upon the question is not to be ignored. Fecal vomiting in intestinal obstruction, the vomiting of fecal masses and enemata by so-called hysterical patients must depend upon the ability of the bowel, especially under abnormal stimuli, to propel the bowel contents in an antistaltic or antiperistaltic direction. These may be considered as two types of fecal vomiting; the hysterical may have many explanations but in intestinal obstruction the contents may be forced out by forceful contractions of the abdominal muscles; antiperistalsis may have nothing to do with it. Treves, Langmann and others have reported the vomiting of formed feces, also the vomiting of enemata a few minutes after putting it in a normal bowel; this can mean nothing but antiperistalsis of the whole bowel. Nothnagel's verdict should be considered final when he says "that in no other way can this vomiting be effected than by well marked, in part even very active antiperistalsis of the intestine." C. C. D.

GYNECOLOGY.

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THE STATUS OF THE FIGHT AGAINST CANCER OF THE UTERUS.

Bovée (*Journal of the American Medical Association,* Volume XLIX, Number XII), in his chairman's address before the Section on Obstetrics and Gynecology, gives the present status of the effort to deal successfully with cancer of the uterus.

The disease, it appears, attacks women of all classes and all races; it is the same scourge alike in the black and in the white. Cancer of the uterus occurs by far most frequently in decades preceding and following the menopause. The disease is local at first but rapidly spreads in various manners,—perhaps through the lymphatics, or the blood-vessels, or then again by direct infiltration. Cancerous lymph glands may not be enlarged and enlarged lymph glands may be free from cancer.

Failure in the treatment of cancer has stimulated a great search for its cause. The parasitic theory of origin still has its advocates. It has been repeatedly shown that cancer in various forms may be transmitted from one person to another, or from one part of the body to another in the same person, by inoculation. Vulnerability of tissue, age, and heredity are important as causative factors.

As regards treatment, since uterine cancer is at first a local disease, early diagnosis and complete removal is the goal we should strive to reach. Women should be taught to seek examination and advice from competent physicians in case of any irregularity or unusual symptom on the part of the genital tract. Concerning various therapeutic methods, the writer advocates radical removal when the diagnosis is made early. The electric angiotribe has been found useful as an adjunct to radical removal. *X*-ray and radium treatment has been uniformly disappointing. The use of trypsin, acetone solutions, and serum treatment are of unknown value as yet. As a preventive measure it is well to regard cancer as a contagious disease and to carefully provide against its transmission from one person to another. C. G. P.

HOW CAN WE LESSEN THE MORTALITY OF UTERINE CANCER?

Montgomery (*Journal of the American Medical Association,* Volume XLIX, Number XII), in discussing this problem, observes that it becomes all the more difficult as we do not know the cause of cancerous growth. Clinical observations make it probable that there may be a predisposition to the disease, both congenital and acquired, more often it being the latter. Continued, prolonged irritation undoubtedly is a very important factor in the causation of cancer. This being true, cancer of the uterus may perhaps often be prevented by the proper treatment of inflammation and lacerations of the organ. Intestinal decomposition with its consequent formation of toxins should be prevented by proper diet and hygiene.

Early diagnosis of malignant change can only be made by careful examination, both macroscopic and microscopic.

In the writer's experience, the prognosis is very unfavorable in patients under the age of forty years. Montgomery's preference is for abdominal radical hysterectomy rather than the vaginal operation which, however, is indicated in fat patients or those unable to stand the shock of the abdominal operation. C. G. P.

Jackson, Michigan, The Colony.

PEDIATRICS.

ARTHUR DAVID HOLMES, C. M., M. D.

THE CARE AND FEEDING OF PREMATURE INFANTS.

MORSE (*Canadian Practitioner,* March, 1907) thinks few infants born before the twenty-eighth week of pregnancy, or whose weight is two pounds or under, and whose length is less than thirteen inches, survive, but no matter how young, how little its weight or length, or how poor its chances, it should be treated as if its chances were of the best. The premature child is undeveloped, and is not ready to live under extrauterine conditions. Its circulation is compelled to change from the fetal to the adult months before it is ready for the change. It is compelled to breathe air into lungs only partially ready for use, with undeveloped thorax and respiratory muscles. It is obliged to use digestive organs only partially completed, instead of obtaining nourishment already prepared through the circulation. It is, in short, not prepared for an independent existence, and has to depend for its life on organs only partially ready to perform their functions.

The peculiarities and weaknesses of the infant at term are exaggerated in the premature infant. The lungs contain comparatively little alveolar structure, and owing to the loose attachment of the blood-vessels are very prone to congestion and inflammation. The pulse and respiration are irregular in rhythm from the lack of nervous control and the undeveloped condition of the organs concerned. The capacity of the stomach varies from five cubic centimeters to twenty cubic centimeters, according to the age and size of the infant. The digestion of fat and proteid is especially deficient and the amylolytic function is practically nonexistent. High external temperatures are dangerous, as these infants are deprived of the chief means of heat radiation, that is, sweating, this function not being developed. On the other hand they lose heat readily. The heat regulating centers being poorly developed they require protection against cold and exposure. On account of their greater loss of heat premature babies need relatively more food than a normal infant, though they are less able to digest it. Their resistance to infection is very slight, their respiration is feeble, their digestion imperfect, and their vitality low. The most important points in the care of premature infants are the maintenance of the animal heat and the provision of a suitable food.

Incubators will maintain the temperature desired, but do not provide sufficient pure, fresh, warm air. The best substitute for the incubator is the padded crib or basket, covered with a blanket to a little below the baby's neck; the temperature can be regulated by hot water bottles, and should be maintained between 90° and 95° Fahrenheit. Avoid bathing of the premature infant. Oil thoroughly at birth and every two or three days afterwards. Avoid clothing, but keep wrapped in absorbent cotton, or in a quilted gown with a hood. The best food is human breast milk. If breast milk is unobtainable a modification of cow's milk must be made, containing about one to two per cent of fat, three to five per cent of sugar and 0.25 to 0.50 proteid, and about five cubic centimeters at a feeding, increasing gradually. It is rarely advisable to feed oftener than once every hour and a half. If the child is very feeble, feeding with a dropper is advisable. A specially trained nurse is always necessary.

SIGNIFICANCE OF ALBUMIN AND CASTS.

SONDERN notes (*Archives of Pediatrics,* February, 1907) the frequency of albumin and casts in urine from conditions outside of the kidney. They do not necessarily indicate nephritis, but may be a functional disturbance due to failure of other organs to perform their duty perfectly. Albuminuria is abnormal. It may be due to slight disturbances in circulation, in quality of blood, or in innervation. The differential diagnosis between a mild nephritis and a functonal disturbance is extremely difficult, especially if due to changes in the composition of the blood, or if due to lesions of the heart or other organs. The estimation of urea is not an accurate basis for an opinion on the severity of the renal lesion. A complete urinalysis is necessary.

APPENDICITIS.

SUTHERLAND believes (*Pediatrics,* April, 1907) the symptomatology of appendicitis is the same in children as in adults, except that pain is often absent in the child. In the beginning of the diseases, when the symptoms are not sufficiently characteristic, incorrect diagnosis is frequently made. Appendicitis occurs, though, rarely in the infant, and may be mistaken for colic, acute intestinal indigestion, intussusception, intestinal obstruction, strangulated hernia, pleurisy, pneumonia, psoas or iliac abscess, enteric fever, peritonitis, nephritic colic, herpes zoster and hip-joint disease.

The cardinal symptoms of appendicitis are pain, tenderness, nausea and vomiting and rigidity of the abdominal muscles overlying the appendix. An acute attack usually begins with sudden pain about the umbilicus, which extends over the whole abdomen, and hence is liable to be mistaken for stomach ache. The pain is spasmodic and paroxysmal. Local tenderness is found over the appendix, usually beneath McBurney's point. High temperature indicates gravity, but low temperature is no sign of safety. Constipation is the rule, but some attacks are ushered in with diarrhea. Rigidity of the right rectus muscle and pain on deep pressure are usually present from the onset, and the former is a most important sign. A local swelling is often found, due early to the omentum and later to the accumulation of pus.

ORTHOPEDICS.

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PARTIAL LOSS OF THE TIBIA REPLACED BY TRANSFER OF THE FIBULA WITH MAINTENANCE OF BOTH MALLEOLI OF THE ANKLE.

Stone (*Annals of Surgery,* Volume XLVI, Number IV) reports a case in which the patient was a boy, five years of age, who in June, 1904, had a dissecting periostitis of the right tibia. Sloughing of the periosteum followed removal of the shaft, with but partial regeneration, radiographs taken after nine months showing five inches of the middle portion of the tibia gone.

It was decided to replace the loss by shifting the fibula into the space. The first operation was performed upon the upper parts and consisted in mortising the tibia, care being taken to dissect periosteal flaps from both bones. The fibula was sawed about two inches from its upper end and at a level slightly above that of the mortise to insure against shortening of the limb. This precaution proved futile, however, because the mortise, to guard against displacement of the fibula, was made a little too deep, and muscular pull drew the end of the fibula up into the medullary portion of the tibia.

The second operation upon the lower parts was performed five and one-half months after the first. The lower ends of both bones were exposed through the same incision and the fibula split for a distance of about four inches, care again being taken to preserve the periosteal coverings of both forks of bone and also the connection between the shaft and external malleolus. The inner fork was sewed to fit into a pocket made in the cartilage of the tibial epiphysis.

The plaster-of-Paris dressings were removed three months after the last operation and the patient allowed to walk upon the limb at the expiration of another month, with a perfect functional result. Radiographs were taken before operative procedures were begun and at different periods thereafter, indicating the progress made. The last one taken nine months after he began to use the limb shows great increase in the size of the fibula with the lower ends of each bone growing symmetrically and only one and five-eighths inches shortening.

OPHTHALMOLOGY.

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SOME NOTES UPON GRANULAR CONJUNCTIVITIS OR TRACHOMA.

Manche (*The Ophthalmoscope,* August, 1907) presents a paper on the contagiousness of trachoma and the differential diagnosis between it and follicular conjunctivitis. The author speaks of trachoma being endemic in Italy and Sicily. In Italy the oculists have organized a "National League Against Trachoma" for the purpose of diminishing its dissemination.

From the transactions of these meetings, together with numerous communications of the members, the author presents the following conclusions:

Contagiousness.—That trachoma is contagious has been admitted from the remotest times, notwithstanding the fact that the causal microbic agent has not up to the present been discovered. In fact, the bacteriologic studies made by many a competent observer in the matter, from Sattler twenty-five years ago down to the present time, have not yet succeeded in discovering and in experimentally demonstrating the presence of a microorganism causing trachoma. Recent experiments have nevertheless put beyond doubt the fact that a piece of trachomatous conjunctiva introduced into the eye of the monkey, as also into that of man, brings on, in two or three weeks, an attack of acute conjunctivitis which, a month later, presents all the characters of true trachoma. They have not stopped at the microscopic appearances, but these appearances have been carried out scientifically, that is, based on microscopic specimens not only of the conjunctiva from which the portion to be inoculated was taken, but also of that which, after the inoculation, developed granular conjunctivitis with all the characters and sequelæ of trachoma.

In March, 1906, Bajardi, in fact, made some experiments with trachomatous grafts on the conjunctiva of four monkeys, obtaining a positive result in three of them, the other being negative. The trachomatous debris, filtered through Berkefeld's candle, gave in sixteen experiments a negative result. These experiments confirm those made by Hess and Rohmer on the monkey.

Addario, of Palermo, however, having tried uselessly for a whole year to discover the microorganism of trachoma, would not believe that such disease was contagious; so much so that he asked Hess to inoculate him with trachomatous debris, which the latter refused to do. When Addario returned to Italy, in 1900, he práctised these inoculations on three completely blind individuals, who were willing to undergo the experiment. The grafts were taken with all possible precautions from three typical cases of trachoma, associated with vascular pannus. A piece of conjunctiva, examined microscopically (namely, fixed in sublimate, embedded in paraffin, and the sections stained by means of the ferric hematoxile of Heidenhain) presented diffuse multiplication of the adenoid stratum in the shape of papillæ and lymphatic follicles of all dimensions, which, according to the author, are the characteristic signs of mixed trachoma.

The trachomatous graft was placed in the inferior culdesac, a small incision having been previously made by means of Bowman's knife. Symptoms of acute granular conjunctivitis followed a week after in three cases, the same process repeating itself spontaneously in the noninoculated eye, by direct contagion from the secretion, and, finally, after six or seven weeks, the development of trachoma was complete in both eyes in all the patients. Both the macroscopic aspect as well as the microscopic examination of the conjunctiva in the three cases revealed typical trachoma.

From the above result Addario concludes that—"Trachoma is a contagious disease, and that contagion has been produced experimentally on man by means of trachomatous mucous grafts, or by carriage of the secretion into the conjunctival sac."

Regarding the diagnosis between trachoma and follicular conjunctivitis, some authors maintain that the two diseases are one and the same thing at different stages, while Manche thinks we have sufficient evidence to state that the two diseases differ essentially. While follicular conjunctivitis is not contagious, and leaves no sequelæ, but disappears even without treatment, granular conjunctivitis is contagious, and is followed by pathologic alterations of the conjunctiva which subsequently bring on palpebral and corneal results so well known.

Samperi notes the different localization of the two diseases. Thus, the granulations of trachoma appear from the beginning on the superior tarsal conjunctiva, invading later the superior culdesac and exceptionally the inferior, extending themselves to the bulbar conjunctiva; while the follicles in follicular conjunctivitis develop themselves nearly exclusively in the inferior culdesac and appear in the shape of small prominences, semitransparent, and greyish-red in color, disposed in line parallel to the palpebral edge. The disappearance of the granulations, besides, is followed by indelible deposits of cicatricial tissue; while the follicles disappear by absorption, the conjunctiva thus returning to its normal state. Samperi also denies the contagiousness of the follicular kind, so much so, that among the cavalrymen, in whom the disease is frequent, owing to the overburdening of the air with dust in cleaning their horses and the ammoniacal vapors exhaled from the stables, he has never observed the transmission of the disease from one man to the other; but the disease attacks mostly those suffering from granular enlargements in other parts of the body, that is, those of a lymphatic temperament. Samperi is so certain that the disease is not contagious, that he caused his own eye to be inoculated with a follicle taken from a patient's eye suffering from the disease, after the follicle had been reduced to a pulp in a sterilized receptacle. With the exception of a conjunctival irritation, which disappeared in the course of a few days, he did not experience any further trouble.

The inoculations practiced by Mayweg, by von Graefe, and by Samperi, by means of the secretion of follicular conjunctivitis, were always negative, whence those who maintain the follicular to be another form of granular conjunctivitis, depending also on a microbic agent, explain this inefficaciousness of the secretion by holding that the infective material is contained in the substance of the follicle itself, which does not undergo ulceration as happens with the granulations met with in trachoma. Samperi holds the follicle to be nothing more than the agglomeration of the lymphoid cells determined by the irritation of the conjunctiva, caused by stimuli, which act more on the inferior culdesac, irritation and inflammation, which may be greatly helped, by the bacteria normally present on the conjunctiva, but these are in no way to be considered as the exciting cause of the disease.

Patella, in a paper read at the Palermo Congress, gives clearly the distinction between granular ophthalmia (trachoma), follicular conjunctivitis, and the papillary hypertrophic conjunctivitis, both with regard to contagion and symptoms, as well as with reference to course and results. He attributes the first to contagion, and the other two to the exposure of the eyes to the action of dust, smoke, salt water, wind, et cetera, and these are consequently more common with workmen, farmers, sailors, and similar people, continually exposed to the above causes. This state of chronic irritation with development of follicles, found normally in these classes, does not require any treatment, and must not be confused with trachoma, which is a specific and contagious disease.

Prophylaxis.—This is the most important part of the subject, especially as regards those nations and cities where trachoma prevails, causing so many ravages, and incapacitating the greater part of the population. Experience and statistics compiled by Italian specialists have proved that in many parts of Italy, but more particularly in Sicily, trachoma is frequent among the poorer classes and those living in bad hygienic conditions, and goes on increasing on account of its contagious nature, of the ignorance common to these classes, and, finally, of their means being insufficient to keep up and to effect a proper cure.

At the Congress held by the Italian Ophthalmological Society in Rome the following resolutions were passed, which Scelingo, a renowned oculist and member of Parliament, took it upon himself to lay before the Italian government, so that the necessary provisions may be issued in due course.

(1) Compulsory notification of all cases of trachoma coming under the notice of both civil and military medical officers.

(2) Obligatory presentation of a certificate to the effect that they are not suffering from trachoma by all those persons applying for admission into schools, colleges, public offices, army, navy, et cetera.

(3) The opening of outdoor departments in all the provinces where the disease prevails, as already done for venereal diseases.

(4) The institution of schools for trachomatous pupils in all the provinces, and the isolation of those already affected in those places where such schools have not as yet been erected.

(5) Periodical inspection of all educational institutes, and diffusion among the people of pamphlets to teach them the way of protecting themselves from trachoma.

(6) The opening of postgraduate courses in the universities both for qualified practitioners and also for district and sanitary officers.

(7) The provision of separate wards for trachomatous patients in hospitals and ophthalmic departments.

OTOLOGY.

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OTITIC PHLEBITIS; ITS SYMPTOMATOLOGY, DIAGNOSIS AND TREATMENT.

McKernon (*Journal of the American Medical Association,* Volume XLIX, Number XI) considers this condition under three heads, as follows:

SYMPTOMATOLOGY.

TYPICAL CASES.

Temperature.—This is the most important symptom, the degree depending on the amount of septic material entering the general circulation. Usually there is a quick rise followed by remission to nearly normal or below. There may be but one rise daily, at first, but later these exacerbations become more frequent.

Chills.—These are seen in not over fifty per cent of cases. They usually precede rise in temperature and sometimes are followed by profuse sweating. Frequently there is only a slight chilliness which, however, in postoperative mastoid cases with frequent temperature fluctuations, are of great importance.

Pulse.—In simple cases this varies with temperature. When brain abscess complicates it, it is much slower.

Perspiration.—There is slight variation early in the disease, but increase during hyperpyrexia to 40, 45, 50 a minute, especially in young patients.

Pain.—This is usually greater when the sinus is affected. It is referred to side of head, occiput, or torcular region. When internal jugular is involved it may extend along neck into chest, and is probably due in such cases to accompanying lymphatic injection.

Nausea and Vomiting.—This is usually present at some stage.

Intraocular.—This is noted only in about one-third of all cases, probably, however, on account of early operation. When cavernous sinuses are affected there is swelling and puffiness of bulb and lid of affected side.

Vertigo.—Only present in cases of long standing or where meninges were affected.

Cerebration.—Normal except in advanced cases.

Physical Signs.—There is occasional edema over mastoid process and exit of emissary and occipital veins. Some cases show stiffness and rigidity of neck muscles. "Cord-like" swelling in neck rare.

Metastatic Deposits.—These may occur in any joint in body.

General Symptoms.—Anorexia, furred tongue, anxious face; later yellow tinge of sepsis.

ATYPICAL CASES.

These invariably follow mastoid operation, and for a few days patients do well; then become restless, irritable, and disinclined to eat. The tongue is dry, the pulse increases in rate, and there is gradual rise in temperature to 104°-105° for several days. There is little or no variation in the temperature curve. Headache and nausea occasional. Patient is irritable at first and later becomes drowsy, the skin is yellow, and there is profuse sweating.

Physical Signs.—It is important to inspect wound, and usually one finds healthy granulations everywhere except over sinus, where bone is darker than normal. Later, granulations become flabby and bone over sinus is still bare, and dark in color. If sinus was bared during mastoid operation the dura over it may be white or gray and covered with an exudate. The sinus is compressible.

CASES WITH BULB AND SINUS PRIMARILY INVOLVED.

Here there is a preceding suppurative middle ear which infects bulb through the tympanic floor.

A most important symptom is a very rapid rise and fall of temperature, with no chill. Patients are fretful and restless, but later become drowsy. The eyes are negative. During temperature remissions the patients feel well.

DIAGNOSIS.

In typical cases the diagnosis is easy.

When we desire to operate on the sinus and have no previous symptoms to guide us the physical signs must suffice. Perisinuous abscess or granulations on the sinus wall are not of themselves indications for the operation.

Bacteriological examination is important on account of the different virulence of the various germs.

Differential blood counts are helpful, and where the polynuclear percentage is over eighty we are almost certain to have an infective process requiring operative intervention.

In the third class of cases we must depend on the history of the middle ear suppuration and the rapid temperature fluctuations.

TREATMENT.

Free removal of the bony sinus wall, opening the sinus and the establishment of free bleeding from both ends of the sinus, suffices in the ordinary case.

When we find a disintegrating clot or pus in the sinus an immediate resection of the internal jugular vein is indicated.

Metastatic deposits require general surgical treatment. M. L. C.

LARYNGOLOGY.

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THE MIDDLE TURBINAL.

At the Laryngologic Section of the American Medical Association, June, 1907, there were presented a number of papers on this subject. These papers have been published in the *Journal of the American Medical Association.*

THE ANATOMY OF THE MIDDLE TURBINAL, WITH SPECIAL REFERENCE TO ITS TOPOGRAPHIC AND SURGICAL RELATIONS.

Loeb presented (issue of June 22) a fitting prelude to the other papers on the middle turbinal, citing in detail the gross and the microscopic anatomy, and followed by the embryology, and the comparative, topographic, and surgical anatomy of the region. The paper was illustrated by carefully prepared charts.

THE PATHOLOGY OF THE MIDDLE TURBINAL.

Goodale described (issue of June 22) the changes which take place in hypertrophy of the middle turbinal, then the edematous infiltration and the polypoid enlargement. Colloid degeneration was next considered, and the author in conclusion outlined the changes which take place in true hypertrophy of the bone and rarefying osteitis.

THE INDICATIONS FOR THE RESECTION OF THE MIDDLE TURBINAL.

Casselberry recounted (issue of July 6) the indications as follows:

(1) To promote drainage and counterdrainage in nasal accessory sinus suppuration, and for access in diagnosis and treatment.

(2) To promote drainage and cleansing in certain types of atrophic rhinitis (atrophic ethmorhinitis).

(3) To relieve edematous turgescence and to provide access for the radical treatment of nonsuppurative ethmoiditis and nasal polypus.

(4) To suspend pressure leading to headache, neuralgia, eye symptoms, and broadening of the nasal bridge, et cetera.

(5) To improve nasal respiration and ventilation.

(6) To relieve hyperesthesia and to diminish certain reflexes; as, sneezing, asthmatic stimuli, et cetera.

TECHNIC OF THE OPERATION FOR THE REMOVAL OF THE MIDDLE TURBINAL.

Richards (issue of July 13) covered this subject. He uses local anesthesia for his operations, and removes the turbinal with a small-bladed, stout, alligator cutting forceps and the snare. After carefully wiping the surface he applies a twelve-per-cent solution of acetotartrate of aluminum on pledgets of cotton until the surface has been thoroughly touched with it. He then powders the surface with a mixture of one-fourth powdered suprarenalin extract, three-fourths aristol. The following ointment is then used on pledgets of cotton: Subnitrate of bismuth and aristol—one-half drachm of each, and one ounce each of oxide of zinc ointment and vaseline. These pledgets are then put in the nose to occupy the space of the turbinal bone removed, which leaves the lower meatus for breathing. They are removed in two days. Saline sprays or douches are used until healing takes place.

THE NONOPERATIVE TREATMENT.

Stucky says that the proportion of the cases in which we find the middle turbinal involved in a pathologic condition that does not require operative treatment for its removal is small. The etiology of these is: (1) Systemic; (2) Local. The nonoperative treatment consists in the removal of the cause of the trouble, and the author sums up the treatment as follows: (1) Correct faulty intestinal metabolism; (2) restore bodily resistance; (3) cleanse, sooth and protect the diseased or irritated area.

PROCTOLOGY.

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INJECTION OF CARBOLIC ACID IN THE TREATMENT OF HEMORRHOIDS.

Franck, in the *Deutsche medizinische Wochenschrift* for February 21, 1907, is of the opinion that this method of treatment has a certain limited sphere of usefulness. In certain carefully selected cases, where there is no local contraindication; the patient refuses surgery; or general anesthesia, recourse to the injection may be had. He advises the use of a fifty per cent solution of carbolic acid in alcohol, and uses it as follows: The hemorrhoid is rendered tense by the application of a wire snare around its base. The wire is gradually tightened so as to cause the tumor to become congested slowly, and the needle is plunged into the center of the mass, and several drops of the solution slowly injected. The snare is not removed until the whole mass has undergone thrombosis. Each tumor is treated in like manner, and a dressing of some drying powder applied.

On the fourth day castor oil is given to move the bowels, and by the seventh or eighth the necrotic tissue has sloughed off. It requires three or four weeks for complete granulation to take place. Deep fissures coexisting, or unusually large tumors are contraindications. Special stress is laid by Franck on the use of the snare before injecting the pile, and the use of the alcoholic solution of carbolic acid as the injection fluid.

DERMATOLOGY.

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"TEN YEARS' EXPERIENCE IN THE TREATMENT OF SYPHILIS BY THE INTRAMUSCULAR INJECTION OF INSOLUBLE MERCURIALS."

Gottheil has treated in the past few years between one and two thousand cases annually (*Journal of the American Medical Association,* Volume XLIX, Number V). The questions relative to the adoption of his method are: "Is the method any better than the ordinary one?" "Are its advantages sufficiently great to warrant the regular employment of a treatment that is a little more troublesome than writing out a prescription?" "Should it be used as the regular treatment in all cases of syphilis?" The doctor unhesitatingly answers "yes." The remainder of the article is merely an argument in favor of his method of treatment.

In the appended discussion of the article are found varying opinions, particularly as to the desirability of the insoluble rather than the soluble mercurial salts for hypodermic injections.

Taylor, of New York City, says: "Intramuscular injection of insoluble mercurials is a method utterly unscientific, mutilating, wholly unreliable as to therapeutic effect, and very often is a menace to limb and life. Absorption of these injections is absolutely a matter of haphazard; we have no control of them whatever."

Zeisler has given thousands of hypodermic injections during the past twenty years and depends exclusively upon the soluble salts.

Klotz, of New York, says that he has used the injections of the insoluble preparations of mercury for twenty-five years and can positively state that they are more effective.

Zeisler, Schmidt and Taylor are in favor of soluble salts; while Ravogli and MacGowan are in favor of insoluble salts. J. F. B.

RADIOLOGY.

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THE ACTION OF THE ROENTGEN RAYS UPON THE NERVOUS SYSTEM.

THIS is the title of a very interesting article by Professor Carlo Colombo, of Rome, Italy, professor of physical therapeutics in the Royal University of Rome (*American Quarterly of Roentgenology*, Number IV, Volume I).

Some patients when long exposed to Roentgen rays exhibit nervous symptoms such as nausea, headache, delirium at night, cramps, anesthesia, abortion, and sometimes paresis and paralysis of the limbs. Animals exposed to the rays daily for fourteen days died with cramps and paralysis. Autopsy revealed meningomizelitic alterations through all the regions of the cord irradiated, also cellular hyperplasia and minute hemorrhagic foci. Paresis of the extremities followed by death resulted from Roentgen irradiation of small guinea pigs and rabbits.

Two cases of observations of the effects of Roentgen irradiation on the nervous system in human beings are reported. The first, a man, treated for rodent ulcer was seized suddenly with violent headaches, nausea, vertigo, inequality of the pupil, and various symptoms of meningeal irritation, which passed away, but were repeated upon the resumption of radiotherapeutic treatment.

The second case was that of a hysterical woman, thirty-six years old, married. Nervous heritage in the family. She was treated by

Roentgen irradiation for a varicose ulcer on the inner front part of the left leg, the radiation in this case, as in the former, being limited to the ulcer area. About four weeks after beginning daily treatment the lady was seized with hysteric convulsions, repeated for three consecutive nights, accompanied by an indescribable condition of nervous agitation. The radiotherapy was discontinued for five days. On its resumption, the patient again devoloped nervous symptoms and sleeplessness, but as the ulcer was improving the treatments were persisted in. Three weeks later, however, the nervous symptoms became so severe that radiotherapy was abandoned. The nervous symptoms meanwhile becoming constantly worse, there were almost continuous convulsions, and absolute sleeplessness. These disquieting symptoms gradually diminished, and altogether disappeared in about five weeks after discontinuing Roentgen irradiation, the ulcer meanwhile continuing to heal.

The author concludes that in this case no other explanation except the following remains: "That the x-rays, though acting locally upon the ulcer, also indirectly gave a stimulus through the medium of the sensitive nerve terminations that extended so far as the spinal marrow and the cerebral cortex, which already constitutes the points of least resistance in the neuropathic individual."

NEUROLOGY.

DAVID INGLIS, M. D.
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AND
IRWIN HOFFMAN NEFF, M. D.
ASSISTANT PHYSICIAN AT THE EASTERN MICHIGAN ASYLUM.

THE SYMPTOMATOLOGY OF LESIONS IN THE LENTICULAR ZONE; WITH SOME DISCUSSION OF THE PATHOLOGY OF APHASIA.

Mills and Spiller (*Journal of Nervous and Mental Disease,* September and October, 1907) contribute a valuable article. The paper is especially timely, as it has important bearing on the claims made by Marie, namely, that the lenticular nucleus is involved in motor or Broca's aphasia. The article is based on the study of eleven cases, with necropsies in ten. The older and more recent views of the function of the lenticular nucleus is given, and an elaborate description of the eleven cases follows. Marie's contentions are given prominence and discussed *pro* and *con.*

The following general conclusions are given:

(1) Lesions restricted to the lenticula apparently do not cause sensory symptoms.

(2) Motor symptoms probably result from lesions situated in

certain parts of the lenticula; speaking generally, the lenticula may be regarded as a motor organ.

(3) Anarthric or dysarthric speech disorders result from lesions of some portion of the left lenticula, which probably contains centers which are concerned with the movements which make speech possible.

(4) Destructive lesions of certain portions of the lenticula probably cause a paresis of the limbs or face.

(5) The paresis or paralysis caused by destructive lesions of the lenticula differs from that produced by capsular lesions, the impairment of power not being so severe and not being so characteristic in the former as in the latter case.

(6) The paresis or paralysis which is caused by lenticular lesions differs from that produced by cortical lesions in that it is less likely to be dissociated; although dissociated lenticular paresis may occur.

(7) While the loss of power which results from a destructive lenticular lesion is permanent, it is usually not intense.

(8) Persistent true motor aphasia, as this form of speech is generally understood, is not caused by a lesion restricted to the lenticula, no matter what its size or destructiveness.

(9) The insula, cortex and subcortex play an important part in speech phenomena, one entirely different from that played by the lenticula and the internal capsule.

(10) The insula is a part of the cortical motor center for speech, Broca's convolution probably forming with the insula the entire cortical motor center for speech.

(11) Motor aphasia may be present without a lesion of the left third frontal convolution.

(12) The lenticula forms too large a portion of the cerebral hemisphere to be regarded merely as a vestigial organ. I. H. N.

THE CEREBROSPINAL FLUID IN PARESIS; WITH ESPECIAL REFERENCE TO ITS CYTOLOGY.

CORNELL (*American Journal of Insanity,* July, 1907) contributes to the interesting and rapidly accumulating literature on the condition of the spinal fluid in paresis. His technique is to be commended, and likewise his clear and concise descriptions. Especially noteworthy are his remarks on "pressure" and his method of estimating the proteid content. His opinions, founded on cases thoroughly and scientifically studied, are as follows:

(1) Every case of paresis exhibits a spinal leukocytosis and increase of albumin.

(2) This sign is also, from point of view of its constancy, in all probability the earliest.

(3) The diagnostic value of a negative puncture is often of greater value than a positive one.

(4) The cell-counting method with Fuchs and Rosenthal's slide is more accurate and rapid than the centrifuge technique, and has the great advantage in permitting comparative results.

(5) The use of Unna's polychrome blue in the *melangeur* permits a simultaneous differential count.

(6) A differential count is important in differentiating the paretic fluid from others, especially where the cytosis is due to a small number of polynuclears.

(7) The conditions under which syphilis produces a spinal leukocytosis demand further investigation, especially regarding the number and character of the cells. The increase of cells in the paretic fluid is apparently independent of any long antecedent syphilis.

(8) There seems to be a correlation, both qualitative and quantitative, between the spinal and hemic leukocytoses, which particularly refers to the mononuclears, but includes the polymorphonuclears, especially after convulsions.

An extensive bibliography is appended. I. H. N.

DIAGNOSTICS.

FRANK SMITHIES, M. D.
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THE CUTANEOUS REACTION TO TUBERCULIN (VON PIRQUET'S REACTION).

Fischer (*New York Medical Journal,* Volume LXXXVII, Number XVI) reports that of one hundred thirteen nurslings, five gave a positive reaction. Of these, three were proven tuberculous postmortem. Of two hundred nineteen children between the ages of four months and fourteen years, thirty-two gave positive reactions. All of these were shown to be suffering from latent tuberculosis. In eighty cases known to be tuberculous (the lesions being scrofulosis, lupus, caries, spondylitis, coxitis, "cold abscess," fungus, bronchial glands, pulmonary tuberculosis, meningitis), sixty-nine positive reactions were obtained. The exceptions occurred in cases of meningitis, pulmonary tuberculosis, spondylitis and coxitis.

Technique.—The skin is washed with sterile water and later with ether. Abrasions of the skin are produced in three places. Two drops of a solution made up of one part tuberculin, one part of five per cent carbolic glycerin, and two parts of a physiologic salt solution, are inoculated by means of a platinum needle on the abraded areas. The remaining abraded spot is left as a control.

Reaction.—In early reactions, twenty-four hours after the inoculations, at the abraded site there is redness and swelling. Later a distinct papule appears. This is usually about ten millimeters in diameter. The reaction may come on as late as forty-eight hours after inoculation. These late reactions are usually found in healed or partly healed tuberculous processes and in older patients. The local lesion may persist as a pigmentation for weeks after the inoculation. A small papule, with mild inflammatory areola, may develop at the site of the control abrasion. Cases of bone and joint tuberculosis and of scrofulosis frequently exhibit very intense reactions.

THE OPSONIC INDEX AS AN AID IN DIAGNOSIS.

VAIL (*Journal of Surgery, Gynecology and Obstetrics,* Volume V, Number VI) finds, from a study of the opsonic index in normal individuals, in which more than three hundred estimations were made, that with but eighteen exceptions, the *gonococco-opsonic index* ranged from .7 to 1.2. In repeated examinations of thirteen cases of chronic gonorrhea, seventy per cent of the indices were below .8 and thirty per cent were .8 or above. In eighteen acute cases, thirty-seven and one-half per cent of the indices were .8 or below, and sixty-two and one-half per cent were .8 or above. In the majority of cases there was a distinct increase in the index following the injection of "vaccines."

Lincoln (*ibidem*) concludes from a tabulation of three hundred fifty estimations of the *tuberculo-opsonic* index in normal individuals that the index range is from .8 to 1.2. In estimations made upon forty tuberculous individuals, the range was from .35 to .9, before treatment with emulsions of tubercle bacilli. The affections were mainly bone and joint involvements. Working independently, it was found that in seventy-five cases, with four exceptions, the low tuberculo-opsonic index was verified clinically.

Frith-Hagans (*ibidem*), working with various forms of *staphylococcus* infections, concludes that when the specific organism can be readily isolated, it is not of great value to attempt diagnosis independently by the staphylococco-opsonic index. The average index in cases examined was .786. Normals examined gave an average index of 1.04. Staphylococcus emulsions usually caused the most marked increase in the index at the beginning of their use.

THE OPHTHALMO-REACTION IN TYPHOID FEVER.

CHANTEMESSE (*La Presse Medicale,* Number LIX, 1907, page 472), experimenting on normal individuals and patients with typhoid fever with a soluble typhotoxin (made from cultures of *Bacillus Typhosus* by precipitation with absolute alcohol, and subsequently dessicated), concludes that in some instances definite ocular phenomena follow injections of one-fiftieth milligram of the powder into the conjunctival sacs of typhoid patients. In from six to twelve hours after the instillation, the conjunctiva of the selected eye shows marked redness, there is an increase in lacrimation and often the development of a serofibrinous exudate. This lasts at least twenty-four hours, and may last several days. There are no alterations in the other eye. In cases which are not typhoid, there is slight redness and very slight increase in moisture two or three hours after the instillation of the dried soluble typhotoxin, but the reaction has invariably disappeared within twenty-four hours; in fact, may last but a few hours.

As to the earliness with which this ophthalmo-reaction is present in cases of typhoid, Chantemesse is unable to state at present. He has produced typical reactions in rabbits in about two days after they have been inoculated with typhoid cultures. The control rabbits showed no more than normal changes.

THERAPEUTICS.

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APOMORPHINE IN ACUTE ALCOHOLISM; A PLEA FOR ITS MORE EXTENSIVE EMPLOYMENT.

ROSENWASSER (*Medical Record,* July 27, 1907), noting the menace an acutely intoxicated person is to himself, and the great annoyance he usually causes to those about him, looks upon any remedy that will correct and overcome this danger and situation as deserving of recognition and of frequent employment. Especially is this the case if such remedy can be used with safety, and without the consent of the patient. In apomorphine, he says, we possess such a remedy.

The hydrochlorate is the form recommended to be used. As solutions of the drug are apt to undergo change and develop new substances that may cause dangerous symptoms, it is always best to employ fresh solutions, preferably those made at the time they are used from hypodermic tablets obtained from a reliable source. The drug should be introduced into the system by means of the hypodermic syringe. Apomorphine occurs in two forms—the crystalline and the amorphous. After stating that there is a conflict of the authorities as to the respective actions and values of these two forms, Rosenwasser advises that the physician should employ the crystalline form. Some care may have to be taken to get this form, as both are manufactured and the amorphous is the cheaper.

To Doctor Charles J. Douglas, of Boston, is given the credit of first calling attention to the fact that apomorphine in nonemetic doses is an exceedingly valuable hypnotic. Doctor Douglas is quoted as follows: "There is, however, one harmless remedy that will produce sleep in a few minutes, even when the patient is suffering with the wildest delirium. That remedy is apomorphine. . . . While its value has remained so long unrecognized by the profession, yet in point of fact there is no hypnotic in our materia medica that is at once so prompt, so safe and so sure. . . . It saves time; minutes as compared to hours."

Three years after Doctor Douglas' announcement Coleman and Polk in Bellevue Hospital studied the drug in three hundred cases. They reported as follows: "From our own observations we are convinced that apomorphine in small or moderate doses, given hypodermically, possesses definite sedative and hypnotic properties. . . . In ordinary "drunks," therefore, apomorphine hydrochlorate may be regarded as an efficient and safe hypnotic in doses of one-thirtieth to one-tenth grain hypodermically administered, producing a sleep which lasts from several hours to all night." Other observers have confirmed these views.

As to the drug being always safe it is stated that several cases of death following its use have been reported, but that Boyer and Guinard, investigating this phase of the subject, claim that untoward results have always been caused by impure preparations.

Rosenwasser asserts that he has had an extensive experience with the drug and finds it a prompt, powerful, and safe hypnotic, second to none in securing quiet and sleep in acute alcoholism. He further says that moderate doses have a stimulating rather than a depressing effect, and that when depression is produced it is transitory and less marked than that from chloral.

The effects of the drug are outlined as follows: A few minutes after an emetic dose has been administered vomiting occurs by reason of the action of the drug on the vomiting center in the medulla. Just before the vomiting occurs the pulse is apt to become weakened and increased in frequency, but, after the vomiting has ceased, to become at once stronger and slower than before the injection was given. Salivation and slight nausea usually precede the vomiting. Very soon after the vomiting subsides, a matter of a few minutes in most cases, the patient falls into an apparently natural sleep to awake from two to eight hours later refreshed, sober, and rational in most cases. In addition to these results the chain of the patient's thought is broken in many cases and the craving for stimulants abolished. The doctor states that he has never failed to secure an hypnotic effect in alcoholics when apomorphine has been used, and only once has failed to secure an emetic effect from one-tenth grain administered hypodermically.

EDITORIAL COMMENT.

OBSERVATIONS REGARDING OPSONIC RESEARCH.

INVESTIGATION disclosing the receptive and repulsive properties characteristic of leukocytes and bacteria is accredited to Leber. Although the phenomenon termed phagocytosis has been ascribed to different causes by various investigators the opsonic conception affords the only tenable interpretation of the mystic evolutions consequential to positive and negative influence. The discovery that the leukocytes were incapable of exciting phagocytic power to very appreciable degree until the bacteria were rendered susceptible by some normal constituent of the blood, marked an instructive and promising stage in the research. For long the assumption prevailed that the serum of blood stimulated the leukocytes to phagocytosis. This theory was constructed on the premises that removal of the serum from the blood by washing destroyed the phagocytic property of the leukocytes, and that the addition of fresh serum reinvested the leukocytes with power to engulf the bacteria.

* * *

The fallacy of this doctrine has been demonstrated by Wright. This investigator, in conjunction with Douglas, established the fact that bacteria possess the faculty of resisting the leukocytes until rendered susceptible by some element peculiar to the serum. The tenability of this hypothesis was proven by subjecting normal blood to heat, thus destroying the active principle. This unknown substance is designated opsonin, in consideration of the fact that phagocytic action is facilitated thereby. The exact constitution of opsonin, or opsonins—the term usually employed, is entirely conjectural, but the definition which has become vogue contemplates a normal content of blood serum the amount of which may be decreased by infection or increased by injection. Certain workers in the domain of opsonic research have essayed to define the opsonizing agent more specifically, and opinions bearing on the nature thereof are fraught with interest and importance by reason of the fact that classification among the body products existing in blood is greatly desired.

* * *

Hektoen and Ruediger, who have devoted much time to opsonic investigation, express the belief that opsonins comprise a haptophore group and an opsoniferous complex, the former facilitating combination with the bacteria, and the latter rendering the bacteria vulnerable to the phagocytes. Neufeld and Rimpau have arrived at the conclusion that the bacteriotrophic substance in the serum enjoys relationship with the receptors of the bacterial cells in which the virulence is vested; in fact, is a reaction product of the infected organism against said receptors. Cowie and Chapin have been conducting investigations along the purely scientific aspect of opsonins for the past year, and a complete report of the laboratory findings has just been published.[1] According to the rendering these workers have demonstrated that normal opsonic serum which has been inactivated by subjection to heat may be restored to activity by the addition of a small amount of very dilute normal serum. The sum total of results obtained from the research incline these experimenters to the belief, premising conclusions on the basis of Ehrlich's theory, that opsonins of normal human serum are not simple substances like toxins and complements, capable of forming "oid" modifications on subjection to heat, but instead belong—in all probability—rather to that group of antibodies invested with a double amboceptor-complement structure characteristic of the hemolysins and bacteriolysins.

* * *

The scope of this article precludes considering the opsonic index or the practical application of the vaccine. The technique elaborated by Wright and Douglas has already been published in this journal, but Walker recently conducted observations[1] which seem to disclose errors of technique previously overlooked and detail precautions which promise trustworthy results. The time required to perfect the index, regardless of the technique involved, militates against the general practitioner employing the treatment; and hence, until the method of preparation is greatly simplified, this therapeutic innovation must necessarily be restricted to hospitals and laboratories in order to yield satisfactory results. Science has certainly discovered another property of blood serum, but the exact relation of this attribute to the bacteriotrophic substances previously known to exist in the hemal fluid still lacks unanimous acquiescence.

[1] *Journal of Medical Research.*

ANNOTATIONS.

ARTIFICIAL RESPIRATION IN THE APPARENTLY DROWNED.

SHAEFER has evolved a new method of artificial respiration which, judging from the simplicity expressed in the modus operandi, promises to become vogue in resuscitations from drowning. Immediately on recovery from the water the person is pronated on the ground, the head being allowed to fall downward and sideward, which naturally facilitates protrusion of the tongue from the mouth, and thus obviates manipulation of that organ during the procedure. Effort at respiratory movement is inaugurated with the operator kneeling beside or astride the hips of the patient, ajusting his hands upon the dorsal aspect of the body immediately over the lowest ribs, and compressing the thorax gradually but firmly with his entire weight to expel the contents of the lungs. This exercise is repeated about every five seconds, or twelve times a minute, pressure being relaxed by swinging the body slowly upward to the angle of beginning without removing the hands. Experiments on the passive living subject have demonstrated that this rate of movement affords an air exchange of from six thousand to twelve thousand cubic centimeters, an amount in excess of that necessary to maintain respiration. The method has likewise been practiced on subjects who have experienced drowning, and the results obtained support the claims advanced by Shaefer.

THE THERAPEUTIC EMPLOYMENT OF RED LIGHT IN THE EIGHTEENTH CENTURY.

THE real value of red light in the treatment of disease is not yet settled. Finsen's observations began the scientific era of a method which really seems to be very old. The application of red light, especially in the treatment of smallpox by Gilbertus Anglicus and John of Gaddesden, has been frequently mentioned. It is often supposed that this form of treatment was abandoned soon after the period of those medieval physicians. In a recent note, however (Printed Editions of the "Rosa anglica" of John of Gaddesden, *Janus,* August, 1907), Doctor George Dock quotes an extract from Eloy ("Dictionaire Historique de la Médecin," 1778), as follows: "Wrapping in scarlet was long in use among the Japanese. Koempfer so stated in the beginning of the century. This idea is not yet extinct in England, for having been called to treat the son of an English infantry captain, I had no sooner declared that he had smallpox than I saw three women who surrounded the child, stripped it and wrapped it in mantles of scarlet. The patient remained in that condition all through the course of the disease."

COLD APPLICATIONS IN HAY ASTHMA.

ANY therapeutic measure that promises relief from hay fever will receive hearty welcome. Wolner recommends the application of cold compresses to forehead and face during attacks of this distressing condition, and cites a case in which alleviation was afforded within an hour. The compresses were applied wrung out of ice water and the process repeated immediately they began to exhibit warmth. This treatment was continued approximately three hours, and then prolonged about six hours with respites at stated intervals according to exigency of situation. The patient did not experience another attack that season but the following year marked the reappearance of the affection. Cold compresses were again brought into requisition for about four hours and entire relief was noted in twenty-four hours, the permanence of which persisted throughout that year.

MEDICAL NEWS.

THE NOXIOUS PRACTICE OF CRIBBING NEWS.

READABLE medical news constitutes an important feature in the successful medical journal. There is news and news, however, and the eagerness with which this department is sought depends upon the manner in which occurrences are recounted. An event may be related in language similar to that employed by the child when unfolding a tale to mother, or perchance in vernacular more euphonious than is characteristic of the puerile type. The architect of the medical news in this journal is satisfied beyound doubt as regards the excellent quality of the article dispensed, and observation leads to the conviction that contemporaries are similarly impressed, for not infrequently items are cribbed from these pages—soul and body, whole and entire—without a scintilla of credit. Of course The Physician and Surgeon is not the only journal extant that dispenses a superior quality of medical news. There are others, and the *Western Medical Review* is one of the number. There is ring in the news content of this occidental exchange. The diction is elegant; the data is accurate; the detail is newsy. And ample reason obtains to account for the excellent rendition! A perusal of the last number discloses the fact that NINE separate and distinct news items were purloined verbatim from this journal without credit.

MINOR INTELLIGENCE.

DOCTOR CHARLES L. BONIFIELD, of Cincinnati, is the newly-elected president of the Ohio State Medical Society.

TULANE University, New Orleans, has decided to admit women if a class of ten who desire to study medicine present for enrollment.

THE Baltimore Medical College has purchased a plot of ground, 64 x 167 feet, at a cost of $30,000, upon which to erect a new laboratory building.

THE highest mortality from plague ever recorded in India extends over the period from January to June, 1907, when 1,060,067 persons yielded the ghost.

DOCTOR JAMES F. HEADY has been called to the professorship of Medical Economics, a chair just established in the Miami Medical College at Cincinnati.

DOCTOR E. GUSTAV ZINKE, of Cincinnati, was elected president of the American Association of Obstetricians and Gynecologists at the recent Detroit meeting.

MERIDIAN, Mississippi, has given birth to two medical colleges within a year. The second venture has been christened the College of Physicians and Surgeons of Mississippi.

DOCTOR H. BEACH MORSE, of Bay City, announces that he has opened an office in The Ridotto, where his practice will be limited to diseases of the eye, ear, nose, and throat.

DOCTOR CHARLES M. EMMONS, of Washington, District of Columbia, has been appointed a member of the Board of Police and Fire Surgeons of that city vice Doctor W. P. Burch, resigned.

DOCTOR JACOB RINEHART, who recently died at Frizellburg, Maryland, enjoys the distinction of having presided at upward of two thousand confinements with an infantile mortality of only two.

The National Medical Association recently assembled in seventh annual meeting at Baltimore. This guild is for colored physicians exclusively, about three hundred of whom listened to the deliberations.

THE Woman's Medical Society of the State of Illinois has been incorporated. The doctors responsible for this movement are Marion K. Bowles, of Joliet, and Sara C. Buckley and Bertha Van Hoosen, of Chicago.

THE Barnes Medical College, of Saint Louis, has formed connection with the University of the State of Missouri, and at the close of the session of 1907-8 will constitute the medical department of that institution.

DOCTOR COLLINS H. JOHNSTON, of Grand Rapids, has been appointed, by Governor Warner, a six-years member of the board of control of the Michigan State Sanitarium for Consumptives, which is located at Howell.

THE Wayne County (Detroit) Medical Society has elected the following officers for the ensuing year: President, Doctor Alva N. Collins; vicepresident, Doctor Kenneth Gunsolus; secretary-treasurer, Doctor Walter D. Ford (reelected).

THE Secretary of War has lessened the requirements for admission of medical officers of the National Guard to the Army Medical School. Henceforth no physical or mental examination will be exacted, a certificate from the Governor vouching for the qualifications and character of the applicant answering the purpose.

DOCTOR ELIZA EDWARDS, of Cincinnati, attended the recent Jamestown meeting of the American Osteopathic Association. Not content with being present merely, Eliza read a paper, and waxed merrily while conveying the intelligence that osteopathic science achieved warrantable renown by the prominent rôle played in the cure of women's diseases alone.

THE Jackson County (Michigan) Medical Society has extended eligibility for membership by modifying its constitution to include reputable homeopaths and eclectics. The new version reads as follows: "Every physician residing and practicing in Jackson county and legally registering as such, who is in good professional standing, shall be eligible for membership."

DOCTOR OLIVER A. LACRONE, of Kalamazoo, Michigan, died at Mercy Hospital, Chicago, on July 18, following an operation on the gall tract. The doctor was a graduate of the University of Michigan, class of 1886, and afterward pursued postgraduate work at his alma mater and in Chicago. He was a native of Springfield, Ohio, where he was born on December 21, 1859. He had been engaged in practice at Kalamazoo since 1890, limiting his work to diseases of the eye, ear, nose, and throat.

DOCTOR JAMES F. CANAVAN, first assistant on the staff of the Northern Michigan Asylum for the Insane, at Traverse City, died of appendicitis on July 26. The doctor was born at Holyoke, Massachusetts, March 11, 1876. He received his literary education in his native city and his medical degree at the University of Michigan, where he graduated in 1899. He had been identified with the institution at Traverse City since that date and had done considerable research work in psychiatry. He is survived by a wife, Doctor Myrtel M., to whom he was married on May 17, 1905.

DANIEL O'LEARY, aged sixty-three, recently completed, at Cincinnati, the feat of walking one thousand miles in one thousand consecutive hours. He would walk one mile the first twenty minutes of each hour and rest the last forty minutes. He usually slept sitting at a table with his head resting on his arms. At the end of the second week he had lost fifteen pounds and was nursing the worst condition experienced throughout the test. He had taken practically no rest from the time of starting, but now he began to shun the curious crowds that plied him with questions, and regular rest was henceforth indulged. The effect was noticeable a week later in better mental and physical condition, a prerequisite which obtained to the finish.

RECENT LITERATURE.

REVIEWS.

AMERICAN PRACTICE OF SURGERY.*

THIS second volume, divided into five parts, does not show the careful arrangement of subjects which is found in Volume I. It seems to be a collection of miscellaneous papers for which no suitable place could be found in the arrangement of the entire work, and they are grouped here simply as a matter of preservation.

Part VI is written by James Farquharson Leys, M. D., Surgeon in the United States Navy. Here we find leprosy, plague, glanders, anthrax, actinomycosis, mycetoma, rhinopharyngitis mutilans and scurvy, with special reference to diagnosis and surgical treatment, all collected under the following title: "Diseases which belong in varying degrees to the domain of surgery, and which are observed in certain parts of the United States and its dependencies, and in Canada." Just why these and no others, more or less, are placed under this heading is hard to understand.

Part VII is a general survey of tuberculosis and syphilis in relation to surgical work, but the paper on tuberculosis is far too short for such an important subject, and the surgical treatment of the disease is dismissed with two pages. Twice the number of pages given to tuberculosis are devoted to syphilis, a subject of far less importance from a surgical standpoint. Tuberculosis from a surgical standpoint is written by V. P. Gibney, M. D., of New York City, who was doubtless compelled to confine his work to an alloted space of fifteen pages. Edward L. Keyes, Jr., wrote the chapter on syphilis from a surgical standpoint.

Part VIII discusses surgical diseases of various widely distributed structures of the body, and embraces abscess, ulcer and ulceration, gangrene and gangrenous diseases, surgery of diseases of the skin, surgical diseases and wounds of muscles, tendons, bursæ and connective tissue, surgical diseases and wounds of lymph nodes and vessels. Here we have another novel collection, some of it decidedly out of place. The paper on abscess by August F. Jonas, M. D., of Omaha, is well written and expresses the author's opinion based upon his own observations. Ulcer and ulceration, written by William McDowell Masten, M. D., has five illustrations, and one colored plate, all original. Gangrene and gangrenous diseases, by Alfred C. Wood, M. D., is an extensive article, covering gangrene in all of its forms, and is well presented. We know of no reason why surgery of diseases of the skin should receive special attention in this book. The writer evidently feels that he is at a disadvantage, although he has presented his subject in a clear and pleasing manner. This part is written by Douglas W. Montgomery, M. D., of San Francisco. The chapter on surgical diseases of the lymphatics, written by Charles M. Dow, M. D., of New York City, is by far the best one of the section. It is well illustrated, and should be read by every practitioner of medicine whether or not he practices surgery.

Part IX treats of surgical disease caused by intense heat and intense cold and the electric currents. The chapter on burns by Benjamin C. Tilden, M. D., of New York City, is presented under the usual divisions. One page is given to the effects of electric currents, and two pages to lightning stroke.

Part X treats of simple and complicated wounds, including gunshot wounds. The first chapter—wounds of the soft parts by cutting and piercing instruments—is written by Captain Carl R. Darnell, of the United States army. Major William C. Borden has written a chapter on gunshot wounds which covers more than a hundred pages.

As a whole, the work of the authors has been well done, which promises well for the coming volumes. C. G. D.

*A Complete System of the Science and Art of Surgery. By Representative Surgeons of the United States and Canada. Edited by Joseph D. Bryant, M. D., and Albert H. Buck, M. D., of New York, Complete in eight volumes. Volume II. William Wood & Company, New York.

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ORIGINAL ARTICLES.

MEMOIRS.

TUBERCULIN IN DIAGNOSIS AND THERAPY.*

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In general, it may be stated that prognosis in tuberculosis varies directly with the earliness with which a positive diagnosis is made. This applies with equal force whether the disease process be in the lungs or in another part of the body. Very many early cases of tuberculosis, particularly those in which the lungs are involved, exhibit certain local alterations which enable one to be reasonably sure of the nature of the pathologic process. The patient's symptoms are usually in accord with our clinical knowledge of the disease. But, within the experience of every surgeon or physician there crop up cases in which the clinical picture is obscured. In these events, unless some means other than mere local or general examination be resorted to, the diagnosis and prognosis must of necessity be guarded. And this uncertainty is not alone confined to those whose experience has been limited. The consequences of this uncertainty have been that many cases have gone beyond the stage where they could be best helped before the positive diagnosis has been made. Experience with a considerable number of such might be offered as an excuse for this paper.

I.

HISTORIC DATA REGARDING TUBERCULIN.

It is but twenty-five years since Robert Koch established the specificity of the tubercle bacillus, although Klebs, Baumgarten, Cohnheim and others had been firm believers in the infectious nature of the disease for some time. Nine years later Koch reported that when cultures of the tubercle bacillus were injected into guinea pigs, he had observed that there was, first, healing at the site of inoculation, later, swelling of the adjacent lymph nodes, and, finally, the development of a tubercle at the point of inoculation. This tubercle usually ulcerated and remained present until the death of the animal. However, it was noted that if one of these inoculated animals were again inoculated with cultures of the bacilli, there was no swelling of the lymph nodes, and that, after a preliminary sloughing, the ulcer at the site of inoculation healed permanently. Practically the same phenomena were observed when dead cultures of the bacilli were injected, and it was later seen that a similar sequence of events followed the use of fifty-per-cent glycerin extracts of the cultures. Koch called this fifty-per-cent glycerin extract "tuberculin." He believed that he had discovered the specific "antitoxin" for the disease, and enthusiastically recommended its injection in cases where humans or bovines were affected. Later, the "tuberculocidin" of Klebs, the two toxins of tuberculins of Maragliano, the "tuberculins" of de Schweinitz and of Deneys, and the "antitoxin" of Marmorek were produced. The discoverer of each fully believed that his preparation was as potent as the original "tuberculin" of Koch.

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*Read before the WASHTENAW COUNTY (Ann Arbor) MEDICAL SOCIETY.

The dazzling prospect of relieving tuberculous subjects by what appeared to be specific medication immediately resulted in widespread use of bacterial products with which even laboratory workers themselves were but meagerly acquainted. There has, doubtless, never been so remarkable an exhibition of enthusiasm in the history of medicine. Europe was literally flooded with "tuberculins." Centers of laboratory investigation were thronged with patients clamoring for this marvellous cure. Without experience as a guide, therapeutic chaos prevailed. There was no means of determining just how much of the tuberculins should be used, when the stuff should be given, how it should be administered, or to whom it could be safely advised. The almost inevitable consequences followed. Overdosing, and with imperfectly prepared materials, speedily produced frightful results. In many cases the disease proceeded with accelerated rapidity. In the majority of instances no improvement was observed. It was only here and there that any permanent results were obtained. The detrimental effects, however, were so largely in evidence, and the popular opinion so soon reacted against the new therapy, that within two years after Koch's announcement of the discovery of his "tuberculin," curative injections had been largely abandoned. The period of enthusiasm had not, however, been devoid of results. The diagnostic value of tuberculin had become firmly established in the minds of careful workers. It is this subject that we would first consider.

BASIS FOR THE USE OF TUBERCULIN IN DIAGNOSIS.

It was early observed by Koch, Weigert, Marx and others that when products of tubercle bacilli growth, or the dead germs themselves were injected into tuberculous animals, there were—provided the doses were not too large or too frequent—fever, general symptoms of acute intoxication and evidences of congestion of the disease process, where this could possibly be watched. In animals free from infection, the injections were not attended with these changes from the normal. The reaction to the injections was usually most marked when the process was early or partly advanced. Fully advanced cases did not appear to give such decided response. If injections were repeated at short intervals, the response was not so prompt or so decided as at first. In human beings, with smaller doses of the tuberculins, practically the same phenomena were noted. Tuberculous individuals reacted; nontuberculous individuals failed to respond.

PREPARATIONS OF TUBERCULIN USEFUL IN DIAGNOSIS.

For general work, it is necessary that any tuberculin preparation that is to be used for diagnosis must be stable, sterile, easily administered and inexpensive. The "old tuberculin" of Koch meets these requirements fairly well. It is prepared from concentrated bouillon cultures of the bacilli, which are extracted with glycerin. It is furnished in vials containing from one to five cubic centimeters, and costs about thirty-five cents per cubic centimeter. It is claimed by the manufacturers that it does not deteriorate on keeping, but it has always appeared to us that the preparation was most dependable when fresh and when kept in a cool and dark place. The required dose is very satisfactorily estimated by means of a glass pipette of one cubic centimeter's capacity and graduated into one-hundredths. The tuberculin is drawn up into the pipette to the required mark, then allowed to flow out onto a clean watchglass, and sufficient distilled water is added to give convenient volume for injection.

The so-called "new tuberculin" of Koch (sometimes called TR) is occasionally used. It is made from dried masses of the tubercle bacilli which are ground up in an agate mortar. They are then suspended in distilled water and the whole centrifugalized. The emulsion then shows two distinct layers—an upper, whitish or opalescent layer and a precipitate. The opalescent layer (*tuberculin obers*) is removed. The precipitate is repeatedly dried, ground, and emulsified until on centrifugalization there is no precipitate to be detected. The different fractions of the fluid, after the removal of the first opalescent layer, and which are really made up of very finely fragmented bacilli, in suspension, are combined to form the "new tuberculin" or "TR." This preparation may be used for either diagnostic or therapeutic purposes. It is best adapted to the latter. It is stable, does not produce abscesses at the site of inoculation, its dose is fairly easily calculated, but it is rather expensive. It is marketed in vials containing ten milligrams of solid substance to each cubic centimeter of fluid. It costs just over three dollars per cubic centimeter. It must be kept in a dry, dark and cool place.

Other preparations are sometimes used. Among these are the recent glycerin-free preparation with which Calmette has produced his "ophthalmo-reaction." The "old tuberculin" is the preparation of choice and is the one generally used.

CLASS OF CASES IN WHICH DIAGNOSTIC INJECTIONS ARE APPROPRIATE.

It is, of course, unnecessary to mention that where sputum is thick with bacilli, where the physical signs at the suspected focus are evident, or where the clinical course of the disease is characteristic, the injections are not indicated. Every effort should be made to find bacilli in sputum, by repeated examinations of fresh specimens; every opportunity should be made to discover local alterations; every detail in the patient's history and present condition should be scrutinized. For, if this is not done, the interpretation of the picture after the injections may be faulty and misleading, and, perhaps, the source of much inconvenience and anxiety to the patient. If the above conditions have been satisfied and one still finds the positive diagnosis obscure, although he may strongly suspect the nature of the disease, it is good practice to advise the diagnostic injections.

In order to insure dependable results, it is quite essential that the following facts be observed:

The patient should be taking no antipyretic medication at the time that tuberculin tests are being carried out. It is a good rule to stop all medication a day or two before the time for the proposed injections.

The patient's temperature should be shown to be within the normal range—or with very slight variations—by two-hourly *recorded* observations for two or three days previous to the injections. The pulse and respiratory rate should be likewise determined.

The patient's physical signs at the suspected focus should be very accurately observed. This is necessary in order that the condition after the injections may be compared with that existing before.

The general condition of the patient should be noted: for example, the presence or absence of headache, of backache, or neuralgia, or pain in the joints, or pain in such special regions as the kidney or the eye.

The existing condition in any surface lesion should be observed.

Any coexisting ailment, as tonsillitis, gastric disturbance, et cetera, contraindicates the injections.

It is advisable to have the patient rest quietly at least part of the day preceding the evening on which the tuberculin is to be injected. Sometimes the extra duties which have to be performed in view of a few days' absence from school or office bring about general or subjective changes which obscure the reaction.

THE INJECTIONS.

The injections are very conveniently made with an all-glass hypodermatic syringe (as the Luer). This form of syringe is compact and easily kept clean. The site of the injections is usually the soft tissue in the interscapular region, the upper thorax or the flanks. The skin should be prepared as for other forms of hypodermatic medication. After the tuberculin solution has been injected, the needle puncture should be sealed with cotton and collodion. This procedure lessens the danger of local infection from clothing, and the like.

It is our custom to give the injections in the dosage suggested by Koch for the "old tuberculin." The initial injection consists of one milligram of tuberculin and is best given at bedtime. The patient is kept quiet, preferably in bed, all of the next day. This detail cannot be too strongly insisted upon, inasmuch as sometimes even what may appear to be slight disturbances—as, for example, examination by many people, a walk to the dining-room, an exciting game of cards—will render observations of doubtful value.

THE REACTION.

This depends upon several factors, chief of which are the physical condition of the patient, the dose of tuberculin administered, the environment of the patient, and to some degree the stage of the tuberculous process. The interpretation of the reaction is guided by the observation of several features of its manifestation. These are: (a) the increase in temperature in tuberculous individuals following injections of tuberculin; (b) the constitutional evidences of acute intoxication, and (c) the local alterations at the site of the suspected lesion. Each phase will be considered somewhat in detail.

(a) *The rise in temperature.*—In typical cases, this begins about eight hours after the injections, although it may be delayed for some time longer. The ascent is rather gradual. In most cases, where the tuberculous process is not far advanced, the temperature rises one and one-half to three degrees above the normal. It may remain for several hours at this point, and then falls quite rapidly. The rise in temperature is frequently preceded by a slight fall, which fact was brought to my notice some two years ago by my then colleague, Doctor Hugo A. Freund. In order to appreciate the variations in the temperature curve, it is advisable whenever possible to have *hourly* observations as soon as the temperature curve shows a tendency to go upward. No rise in temperature of less than one and one-half degrees should be considered anything more than suspicious. Nor has it appeared to us that evidence of increased temperature of itself should be considered positive proof of tuberculous infection. It should arouse such suspicion as will lead to close investigation of the suspected focus.

(b) *The constitutional manifestations of reaction.*—In typical cases, coincident with the rise in temperature, the patient may complain of feeling tired, of headache, of pains in the muscles, of pains in the joints.

There is often a sensation of chilliness, rarely an actual chill. Anorexia is common, particularly where the febrile reaction is prompt and marked. There is occasionally nausea. This is not always the case, however, as some patients exhibit either of these manifestations of reaction without the other. The constitutional discomfort usually persists for a longer time than does the temperature rise.

(c) *The local evidences of reaction.*—Commonly, especially in cases of incipient pulmonary tuberculosis, this feature is overlooked, and should there be no rise in temperature or constitutional symptoms, a negative report is returned. The careful examination of the local alterations after injections of tuberculin should never be neglected. In some cases it is the only striking feature of the reaction, and may of itself be the strongest evidence in making a positive diagnosis. The local changes in the *lungs* may make themselves manifest by harsher breath sounds, greater increase in transmission of the whispered voice, the presence of râles where none had before been discovered, or an increase in number or an alteration in their character. In affections of the *pleura,* there may be the development of a pleural friction rub, or in some cases the disappearance or the lessening of one that before existed. In *joint disturbances* there is often pain or soreness, swelling, or impaired function. *Skin lesions* exhibit greater vascularity, with redness and swelling. In affections of the *larynx* or the various parts of the *eye,* one frequently observes added evidences of engorgement. In *renal affections* local tenderness or pain, with the presence of albuminuria, may be noted.

Duration of the reaction.—In the majority of positive cases, the evidences of reaction have disappeared within thirty-six hours. Sometimes the reaction begins late and may thus appear to be prolonged. This may be noted in old, fibroid cases. It is essential that the patient be kept at rest and thoroughly examined from all standpoints just so long as he presents any deviation from his previously noted condition. In cases where the reaction appears to be especially late in its onset or prolonged in duration, it has always seemed advisable to us to look for other causes to which the change might be ascribed. We have seen instances where evidences of local infection at the site of the injections, tonsillitis or gonorrhea, confused the picture.

When the injection of one milligram of tuberculin produces no reaction as described, the patient cannot be said to be free from infection. He should be kept quiet for from three days to one week and, under conditions before mentioned, an injection of five milligrams of tuberculin may be given. For at least two days following the second injection the patient's condition should be carefully observed. If with this second injection there is no effect produced, then after another resting period of from three days to one week, an injection of ten milligrams may be given, and the patient observed as before. To many, a negative result with the injection of ten milligrams of tuberculin is deemed all that is necessary to exclude tuberculous infection. There are other observers, however (Koch, Marx), who recommend that the final dose of ten milligrams should be repeated before it can be said positively that a suspicious case is free from infection. If there is any tendency shown to reaction of a given dose, then it is deemed good practice to repeat that dose before larger doses are administered. In all events, the injections should not be given, however, at too frequent intervals, else an immunity may be established and no reaction result.

The above described method is not the one universally adopted. Certain observers advise the injection of one-fifth milligram of tuberculin three or four successive times, at intervals of three days. Then, if there is no reaction, the doses are rapidly increased to one, five, or ten milligrams. This method is reported by Hinman and Wolmann to be especially valuable in ambulant cases. Whittaker, Maragliano and others believe in the early injection of large doses, namely, five, ten, or twenty-five milligrams. This does not always appear to be good practice. Several cases have been reported where the injection of large initial doses have been followed by rapid collapse. In children it is advisable to begin with very small doses, say from one-two hundredth to one-fiftieth milligram. (SEE CHARTS.)

The question of maximum dose.—With so many variations in dosage suggested for the diagnostic use of tuberculin, it is quite proper to inquire into the possibility of there being a maximum dose. While the observations of such workers as Trudeau, von Ruck, Maragliano and Koch appear to show that large doses never cause very serious consequences, and are justified for sake of securing positive evidence, one may surely question the advisability of giving such, when repeated small doses are followed in many instances by quite as positive reactions as larger ones. The question of the time required to obtain positive information with smaller doses may sometimes, however, be an important factor in deciding for the larger doses.

It is upon the point of danger attendant upon the use of tuberculin for diagnostic purposes, as well as regards the early experiences with the preparation, that there frequently exists in the mind of the practitioner considerable doubt as to the confidence with which he may recommend the injections to his patients. Frequently patients themselves ask questions along these lines. It was early suggested that the inflammatory reaction occurring about tuberculous foci subsequent to the use of tuberculin might result in the wide dissemination of the bacilli. It would seem, at first blush, that such were possible, for, with congestion about the tubercles, it appears reasonable to suppose that the bacilli might be carried out into the general circulation or into the surrounding tissue with the subsidence of the reaction. Koch's observations on animals, and later those of Trudeau, Kinghorn and others lend strength, however, to the opinion that tuberculin, properly administered, is never followed by untoward results. The more recent work in opsonins seems to indicate that the local increase in opsonic power of the serum after tuberculin injections, exerts a curative rather than a deleterious influence on the tuberculous process. One can

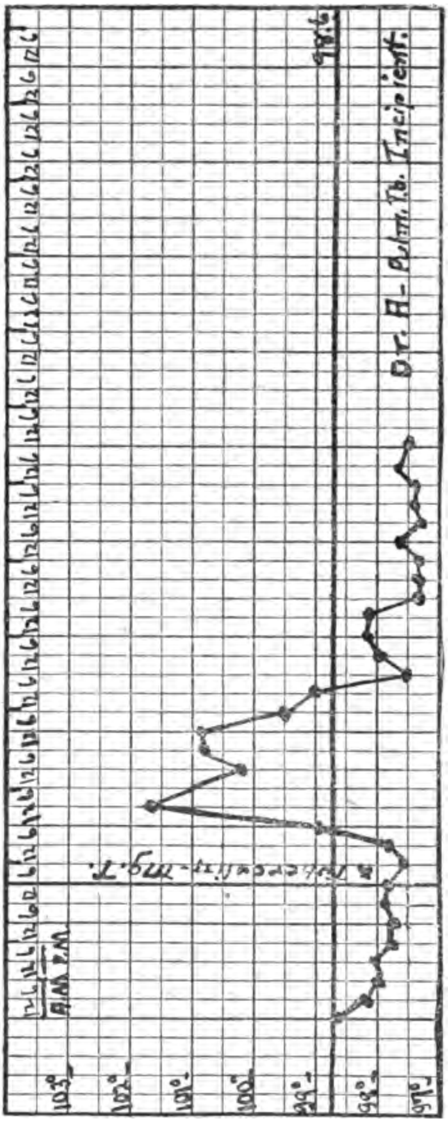

CHART ONE

SHOWING PROMPT REACTION TO ONE MILLIGRAM TUBERCULIN.

readily conceive of a condition, however, where the frequently repeated injections of large or even small doses of tuberculin might result in the prolongation of the so-called "negative phase" and serious harm to the patient.

Specificity of the tuberculin reaction.—The question has excited considerable controversy. While the reaction has been obtained in patients affected with diseases other than tuberculosis, for example, syphilis, actinomycosis, leprosy, and even in supposedly healthy individuals (Franz, in sixty-one per cent of "able-bodied recruits" to the Bohemian army), yet it is generally admitted that, for all practical purposes, the reaction may be considered specific for tuberculosis. In

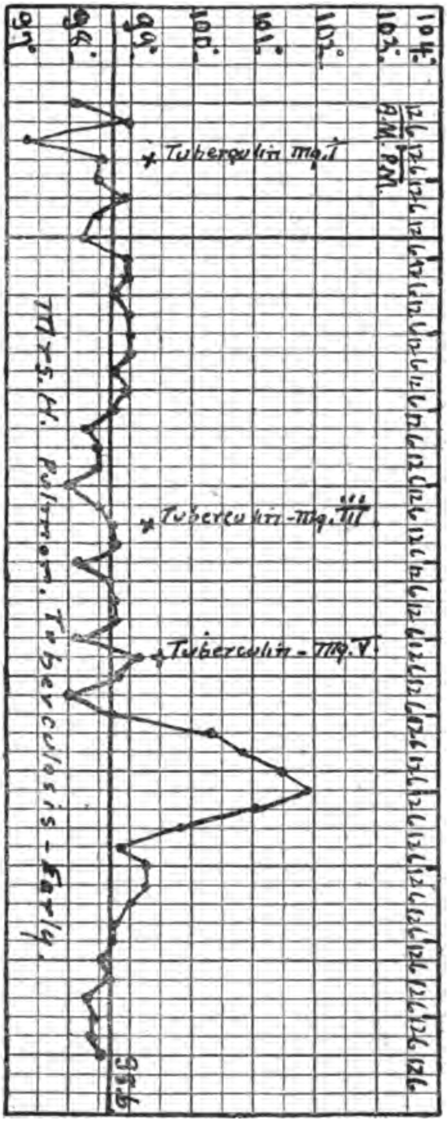

CHART TWO

SHOWING DECIDED REACTION TO FIVE MILLIGRAMS TUBERCULIN AFTER INJECTIONS OF ONE AND THREE HAD PRODUCED BUT SLIGHT TEMPERATURE CHANGE.

the event of its appearing in certain cases of leprosy and actinomycosis, it is suggested that a reaction results on account of the close relation that exists biologically between the organisms in question; that the reaction is then more in the nature of a "group reaction." (Cornet and Meyer). Errors in technique and in the choice of preparation are always to be looked for when the reaction appears atypically. Frequently the existence of a previously overlooked focus of disease is responsible for the reaction.

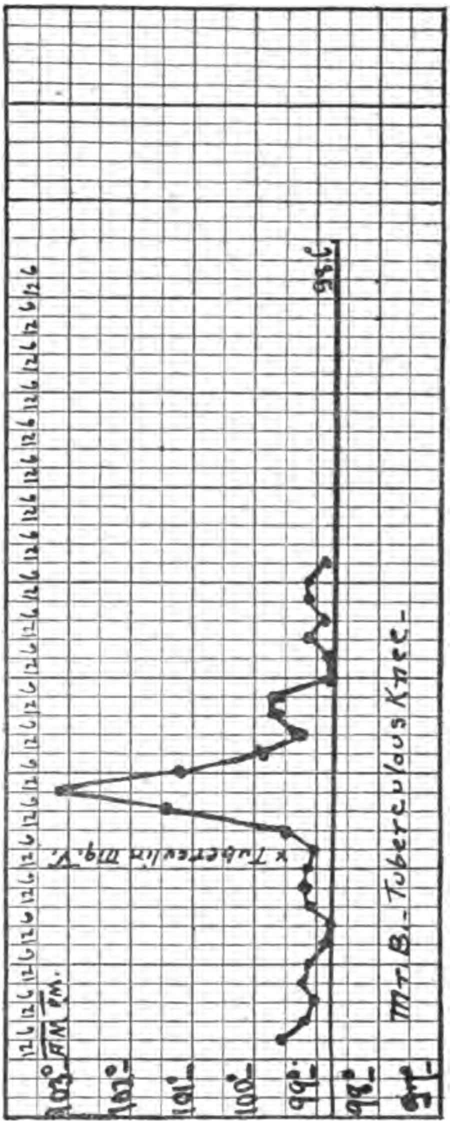

CHART THREE

SHOWING PROMPT REACTION TO INITIAL INJECTION OF FIVE MILLIGRAMS TUBERCULIN.

SUMMARY.

In closing these remarks upon the diagnostic value of tuberculin, it appears that one is justified in concluding:

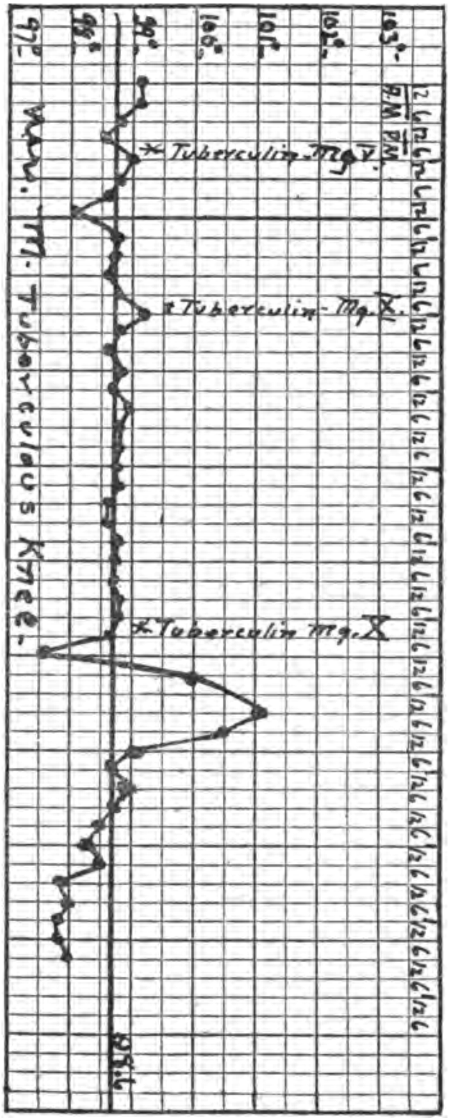

CHART FOUR

SHOWING REACTION FOLLOWING REPETITION OF TEN MILLIGRAM DOSE WHEN FIVE AND TEN MILLIGRAMS HAD SHOWN NO FEBRILE RISE.

That the essential feature in the cure of tuberculous lesions, be they located where they may, is early diagnosis.

That early diagnosis is frequently possible from a consideration of the clinical history and the careful examination of the patient.

That there exists, however, a class of cases where this early, positive diagnosis is impossible by ordinary methods of procedure.

That tuberculin has been shown to be a dependable, and practically specific, diagnostic agent, when properly administered. It is cheap, is easily manipulated, and is harmless when given with care.

II.

TUBERCULIN THERAPY.

The recent advances in the treatment of infectious diseases by the exhibition of so-called "specific vaccines," containing dead organisms which have been grown from germs isolated from the patient under treatment, have revived the already described interest in the treatment of tuberculosis by tuberculin. While the day has not yet come when one can prognose satisfactorily the actual therapeutic value of the injections in a given case, yet data is steadily accumulating which tends to prove that, in selected cases, permanent benefit may be assured. In many instances the reported statistics are to be taken *cum grano salis,* for in the majority of cases strict attention has been paid to hygienic methods of treatment, at the same time that the therapeutic inoculations of tuberculin were being given. Just how much benefit was derived from the tuberculin in those cases is not always to be determined.

The therapy with tuberculin is not without scientific basis, however. It has been observed by many workers that, in patients with tuberculous foci anywhere in the body, the estimation of the tuberculo-opsonic index reveals a lower than normal ratio. It has also been observed that, when emulsions containing dead tubercle bacilli were injected into such patients, the active process was frequently retarded, and sometimes complete healing resulted. At the same time there was noted an increase in the tuberculo-opsonic index. Although for some years clinicians had seen improvement result from injections of bacillary emulsions or products of the growth of the bacilli, until recently the direct measure of the curative factors could not be determined. Even at the present time the evidence is far from being satisfactory, for, while one can measure the fluctuations in the tuberculo-opsonic index with a certain degree of accuracy, the impediments to absolutely accurate work are many. It is probably more difficult to attain perfection in technique in tuberculo-opsonic work than in opsonin work with any other organism. The reports of pronounced and marvellous increases in the index of tuberculous patients, while exciting great interest, should at the same time invite close scrutiny of conditions under which the work has been done. At a time in the near future, it may be that we shall be able to measure bodies other than opsonins and agglutinins, in patients' sera, which will make the accurate control of tuberculin injections a more simple affair.

At the present writing cases which appear to be most favorably influenced by tuberculin injections are those in which the infective process is fairly well localized. The presence of secondary infection, so common in advanced stages of the disease, may explain this to a certain extent. In the category of cases which are frequently favorably influenced, we would mention particularly, incipient pulmonary tuberculosis, tuberculosis of the glands, of the bones, of the skin, of the pleura, of the bladder, and of various parts of the eye. In many instances, it is advisable to first substantiate the diagnosis by injections of tuberculin or by pathologic sectioning.

PREPARATIONS OF TUBERCULIN USED FOR THERAPEUTIC EFFECT.

The preparation of choice is the "new·tuberculin" of Koch. The "bacilli emulsion," the "watery extract" of von Ruck, and the serum of Maragliano are frequently used. The injections are made with any convenient and easily sterilized hypodermatic syringe, and with all the precautions regarding surgical cleanliness. The back, the upper thorax or the flanks are well adapted to receiving a number of successive injections. The patient should be proven fever-free, or nearly so, for at least twenty-four hours previous to the injection. The physical condition at the infected focus should be carefully noted. The injections are preferably given at night. It is best to keep the patient quiet the day following. Examinations should be made as when tuberculin is used for diagnostic purposes. The temperature, the constitutional symptoms and the local changes should be observed.

DOSAGE.

In giving the injections care should be taken that only freshly prepared solutions be used. If they have been kept longer than twenty-four hours, it is advisable to discard them. If they are at all cloudy they should not be used. Although one cannot say that there is any set rule regarding the amount of the beginning injection, yet it appears to us that working with the "new tuberculin" of Koch it does not seem that so small a dose as one-thousandth milligram should be used. We fully realize that even smaller doses than this have been recommended, yet unless one is giving such with some special scientific problem in view, these small doses are frequently a waste of time, and are certainly an annoyance to the patients. Doses of one five-hundredth milligram are safe, in the majority of instances. They usually produce recognizable effects, and they are not so large as to be dangerous. If larger doses are used at the outset, a true tuberculin reaction may result, and if these doses are frequently given, the "cumulative" effect (prolongation of the "negative phase"?) may be disastrous. The effect on the opsonic index or the evidences of local or general reaction are the only true guides to the amount of tuberculin to be injected. In view of the difficulties in respect to the former, the close scrutiny of the local focus furnishes most valuable information regarding the size of dose after the initial injection.

If no reaction other than local follows the initial injections, then the size of the dose can be gradually increased, as, for example, to one two-hundredth milligram, to one one-hundredth, one-fiftieth, one-twenty-fifth, and so on. Cumulative action may be avoided by giving the injections at intervals of from five to ten days, as indicated. When possible, opsonic estimations should control the injection-time. If this is not possible, then if at any time there is even the slightest evidence of rise in temperature, constitutional symptoms or marked aggravation of the process—especially if this is *persistent*—in the affected part, the injections should be discontinued for a time. When they are again begun, the dose should be considerably smaller than the one which caused the acute exaccerbation. If these details are attended to then, as shown by Jeans and Sellards, in many cases the satisfactory progress of the case is possible without the opsonic estimations.

Pulmonary tuberculosis.—Our own experience in the treatment of phthisis with tuberculin has necessarily been limited. This is to be expected in a hospital where patients come oftener for diagnosis than for treatment. Other observers who have been more fortunately situated report encouraging results from the injections.

Meyer, using the new "bacilli emulsion" of Koch (suspension of pulverized tubercle bacilli in water, to which an equal quantity of glycerin has been added), in doses varying from one-half to from five to twenty milligrams, given on an average of once a week, reports very favorable results in twenty-five consecutive cases. In all his cases the diagnosis was positively determined before the injections were begun. Sometimes the diagnosis was determined by tuberculin injections. The improvement was shown by gain in weight—often markedly so,—disappearance of fever, absence of sputum or tubercle bacilli in it, and improvement in physical well-being. Many of Meyer's cases were patients who had been under ordinary sanitoria treatment for varying periods. The most pronounced improvement occurred in early cases, the least in late-stage cases where secondary infection was present. In some of the early cases the results have pointed towards permanent cure. No ill effects were noted as following injections of large doses of bacillary emulsion.

Pogue furnishes interesting data from the treatment of one hundred sixty-seven cases of tuberculosis with tuberculin. He reports recovery in twenty-eight out of thirty cases which were treated by nothing but tuberculin. He observes that cases so treated show less tendency to recur than do those which yield to climatic influences. He believes that frequently repeated small doses are better than are large doses widely separated. He has never seen ill effects follow the use of tuberculin. He warns against the giving of the injections, however, in cases which are distinctly febrile and those suffering from mixed infection. He has seen little benefit in cases where cavity signs were not wanting.

Von Ruck, summarizing four thousand seventy-six cases treated by himself and by practitioners under his direction, with the watery extract of tuberculin, notes apparent cure in two thousand two, or forty-nine one-tenth per cent; arrested, greatly improved, or improved in one thousand three hundred fifty-seven, or thirty-three three-tenths per cent; and failure to affect the process in seven hundred seventeen, or seventeen six-tenths per cent. As to the permanency of the results obtained, he further reports that out of six hundred two cases treated by tuberculin injections and which have been discharged for periods varying from two to ten years, sixty-eight per cent have received lasting benefit. While in the majority of von Ruck's cases the disease was early recognized and promptly treated, yet there appears to be a fair proportion of moderately advanced cases. There is no mention of just what proportion of the cases carried out more or less rigid hygienic treatment. The dose range is not mentioned. The effects of the injections upon the patients, other than upon the complete terminal picture, are not described.

Hammer, Kreiger, Trudeau and others write favorably of the value of tuberculin as a therapeutic measure in certain selected cases. It thus appears fairly well established that even in moderately advanced pulmonary tuberculosis substantial improvement may frequently be gained, and this sometimes much more speedily and permanently than when hygienic measures alone are carried out.

Local affections other than in the lungs.—Here better results are to be expected. Wright and Bullock report most encouraging results in tuberculosis of the genitourinary tract. Jeans and Sellards, working at the Johns Hopkins Hospital, have observed consistent and permanent improvement in cases of bone and joint tuberculosis. In our own experience, using TR, we have seen marked improvement follow the injections in cases of pronounced, general involvement of the pleura, tuberculosis of the cornea and of the eyelid. In no case did the injections appear to be harmful to the patient.

Against this weight of positive evidence there can be found much that is unfavorable. In many instances judgment has doubtless been hasty or biased. Frequently it is not difficult to recognize errors in technique, improper dosage, unsuited subjects or the use of inert preparations. It is as yet too early to pass final judgment in the matter. The results are, however, encouraging enough to warrant the continuance of the injections in selected cases. If this is done, with proper attention to details and with careful clinical observation, much information of value may be gained. The results should be carefully compared with those in cases which have been treated by dietetic and hygienic measures alone. Conclusions drawn from such comparison will certainly be both interesting and valuable. At present it does not appear to be wise to neglect measures which have been proven to be beneficial in many cases. If better results can be obtained by the combination of tuberculin injections and hygienic and dietetic measures, then such combination is doubtless justifiable, when the welfare of the patient is the first consideration.

In the preparation of this paper, the writer was aided greatly by numerous suggestions from Professor Dock, and he desires here to express his indebtedness.

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AMNESIC CEREBRAL AUTOMATISM IN EPILEPSY, WITH REPORT OF THREE CASES.*

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Much has been written about disorders of memory and their association with organic and functional neuroses and psychoses, and material for the study of disorders of memory is found scattered through medical works, treatises on mental diseases, and the writings of psychologists, but not until Ribot wrote his "Psychological Monograph of the Diseases of Memory" was there anything collective. He discussed the subject more broadly and considered memory in its entirety, studying the general physiology and psychology and at the same time its pathologic manifestations. Huxley, Clifford, Maudsley and others have opened the way for a new theory by maintaining that consciousness is only the accompaniment of some nervous process. With this fact established the way through the problem of the psychologic conditions of memory became more clearly defined.

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*Read before the Ann Arbor Medical Club.

Through the activity of the brain there are produced certain mental states. These must have a certain intensity and duration in order that there may be retention of certain states and reproduction and localization in the past. While these elements are of unequal value, yet the absence of any one of them will produce a disorder of memory, partial or general, as one or more of these elements essential to memory may be suppressed or absent. Hughlings Jackson was the first to describe in detail the dissolution of memory as occurring in an inverse order to that of evolution. The higher complex voluntary functions of the nervous system disappear first and the lower and automatic functions disappear later.

In the study of progressive amnesia these facts are clearly illustrated. The disturbances are at first restricted to recent events but later extend to ideas, and successively to feelings and affections, and finally to acts. Every-day experience has noted the natural inequality of the different forms of memory in one and the same person and the variations in different individuals. To a certain extent this may be ascribed to different habits of attention and to a difference of selection among the different objects and events presented to the individual curiosity. For instance, in walking half a mile down a street all the shops in their respective positions might be named, and again we might not recall any one in particular. One person recollects forms best, another colors, and so forth. It is probable that the memory of the former depends mainly upon the muscular sensibility of the eye; that of the latter upon the retina and the nervous apparatus connected with it. This also applies to hearing, smell, taste, and those diverse forms of sensibility comprised under the general name of touch; in short, all sense perceptions, and as these may differ in constitution so the impressions transmitted may be faint or strong, staple, or transient. It is evident, therefore, that in the same individual an unequal development or distortion by disease of the several senses and of the several organs causes similar modifications in the corresponding parts of the nervous system consisting of certain determinate parts totally differentiated, each of which, though most closely associated, possesses a function of its own.

It has been suggested that disorders of memory may exist in otherwise normal individuals. This may be true to a very limited degree. To the alienist it is but a symptom of a morbid state of the brain which may be functional or organic. Nevertheless disorders of memory must be studied in themselves as morbid psychic states which may enable us to understand the normal state, and to classify, to interpret and to draw conclusions as to the mechanism of memory that may be of equal worth and serve in the diagnosis of morbid conditions. In many of the cases we find the disorder of memory restricted to a single class of recollection, all the rest remaining intact. These are only partial disorders. Others, on the contrary, affect the entire memory, as in organic disease, destroying it utterly step by step. We thus recognize a partial and general amnesia. This may be temporary, periodic, progressive, or even congenital. The following cases are illustrations of a periodic disturbance of memory.

Case I.—A locomotive engineer applied for treatment at the University hospital four years ago, stating that he had periods of unconsciousness of variable duration, in which time he performed the duties of his occupation perfectly. He related that he came a distance of forty miles over the daily route with his engine, made two stops, and when reaching the terminal he could recall nothing that had transpired from the time he left the station forty miles distant. The fireman who was beside him in the cab stated that the engineer managed the machine as usual, that he had noticed on one or two occasions that the patient in question became intensely pale and that during this attack he was irresponsive. The patient himself complained of being rather more tired than usual. He did not remember having disturbance of any kind previous to that just described, and he has always been in good health. He is thirty-four years of age, of good general appearance, and physically well developed. His family and personal history is good, there is no neuropathic or psychopathic heredity nor debilitating conditions in antecedents. He denies syphilis and there is no evidence of specific disease. The physical examination revealed nothing of importance.

During his stay in the hospital, a period of two months, he had four attacks of amnesia. Two of these were observed by the writer. The patient, who was walking about in the ward, appeared rather pale, had staring countenance, would not respond to questions, was unconscious of surroundings, exhibited expressionless face, was insensible to touch, and gave no evidence of pain when pricked with a pin. Hearing was absent and there was no evidence of vision, although he made his way through the wards evading all objects. The gait was not peculiar and he had perfect control of his limbs. The attack lasted about four minutes, when the pallor of the face disappeared, the expression changed, and the patient found himself seated in a chair and knew nothing of his wandering about the wards nor of my presence during this period. Other attacks were very similar. After leaving the hospital he was free from the attack until two years later, when he returned on account of having had two severe convulsions, which proved to be typical epileptic seizures.

Case II.—A man thirty-two years of age, and farmer by occupation. His general appearance was good and he exhibited a robust physique. A brother died of tuberculosis at the age of twenty-one. Otherwise the family history was negative. He had the ordinary diseases of childhood before the age of twelve. There was no history of convulsions and he denied venereal disease. He was in perfect health until three years ago, when he first became aware of the lapses of memory through a friend from a neighboring town whom he had visited a few days before the friend returned his call. Upon seeing him he was much pleased, stating that he had not seen him for a long time. When questioned regarding the recent visit he knew nothing about it and could not recall when he had been away from home. The friend stated that he noticed nothing peculiar about the patient during his visit except that he suggested to him once or twice that he looked rather pale, and the patient complained of becoming easily exhausted and feared that he was not quite well. Six months later the patient in question moved to another town, purchased a farm, and within a week he had no recollection of this transaction. He continued to work and seemed quite well, though his wife noticed a marked pallor of his face and an unusually quiet manner occasionally. However, he complained of nothing until three years later, when he suffered from periodic attacks of unconsciousness of momentary duration. During these attacks his face was pale, the eyes staring, work engaging his attention would be interrupted and almost immediately resumed. In talking he would suddenly stop, look absent-minded, but never fall nor stagger. He had no knowledge of any unusual occurrence.

About this time I had the first opportunity to observe him. One morning I met him on the street and greeted him, but he gave no response, continuing his journey onward. I followed him. He walked a distance of five squares and returned to the starting point in a perfectly natural manner. During this time he was totally unconscious of his surroundings and knew nothing of my presence. When he recovered spontaneously he had no knowledge of anything he had done. His gait was natural and there was no incoördination. His face was pale and expressionless. There was no muscular twitching. Several attempts to arouse him were fruitless. His head was slightly bent forward, his eyes were directed toward the ground and apparently motionless. Objects held before him and whistling in his ears made no impression. Pricking the hands and face with a pin gave no evidence of sensation. The pupils were large and insofar as observable accommodation was present and reaction to light was prompt. It was impossible to obtain other neurologic data. After the attacks and during the interval the patient enjoys good health and complains of nothing. There is no change in his mentality. The physical examination revealed nothing of interest.

Neurologic examination revealed no changes in the cutaneous sensations. The special senses were normal, and motor functions intact. The superficial reflexes were not disturbed. The deep reflexes were overactive in general. The sphincters were not disturbed. This is true during the attack as well. There is no abnormal mental state except during the attack. One year after this observation the patient had a severe convulsion, a typical epileptic fit.

Case III.—A man, age thirty-eight years, a barber, with a good family and personal history. He is a man of temperate habits, there is no history of venereal disease, and he has three healthy children. He was in good health until three years ago. One day he left his place of business, walked out into the country for a distance of three miles, entered a field where he found a team of horses hitched to a plow, and plowed around the field two or three times, making the furrows in perfect order. The farmer, who had left the team while going on an errand, had returned by this time and approached the intruder to enter protest against his actions. The patient, however, disregarded the objection and went on with the work he had undertaken. The farmer, fearing that he had encountered a lunatic, made no further interference, and in a few moments the patient recovered spontaneously, amazed to find himself at work on a farm where he had never been before, and in a line of work in which he was inexperienced. He had no recollection of anything that had happened from the time he had laid away the razor until he found himself busy on the farm. On another occasion this patient walked several miles to a neighboring town and returned home unconscious of the fact that he had been away. Subsequently he had frequent attacks of momentary unconsciousness, interruptions in conversation, or whatever he was doing was stopped and immediately resumed. The patient had no knowledge of anything unusual having occurred. Members of the family noticed that pallor of the face usually preceded the disturbance of consciousness.

When I first saw the patient he appeared to be in good health, and he himself stated that he was as well as ever and knew nothing of the condition described above except his experience with the farmer which was related in the history. The physical development of patient is good. He is a strong, robust individual. The physical and neurologic examination was negative. His mental condition was entirely normal, his statements clear and concise, and he appeared to be a man of some intelligence. This observation was made three years after the first disturbance and previous to the attacks of momentary unconsciousness. I saw him again one year later. During the interval he developed what seemed to be fractional epileptic attacks, which became more pronounced and finally ended in severe convulsions. At this time I observed him during several attacks of momentary unconsciousness. The most noticeable conditions were the marked pallor and vague expression of the face. There were no muscular twitchings of the face and no rigidity in any part of the body. There was no change of position and the patient did not fall. Sensibility was entirely lost. The duration of the attacks varied from five to twenty seconds.

The cases differ widely from one another. Sometimes a disturbance of memory begins at the onset of the disease, covering events that happened thereafter. Again it covers the events just previous to the seizure, in cases associated with epilepsy. Generally it extends in both directions, both to the time before and the time after the attack. The amnesia may precede the epileptic seizure for years. It is, however, questionable whether or not temporary amnesia in cases of epilepsy differ materially from attacks of petit mal, except in severity and duration.

It is evident from the foregoing cases that either the period of mental automatism is unaccompanied by consciousness—and in that case amnesia needs no explanation, for as nothing was produced nothing can be retained or reproduced; or, there is consciousness, but so faint that amnesia ensues. I believe this to be true in a great many instances. In the first place it is difficult to see how very complex acts can be performed without some measure of consciousness at least intermittent. It is clearly illustrated in at least one of the cases mentioned above that as far as can be demonstrated general and special sensibility was absent during the attack, which would prove complete unconsciousness. If the functional activity of the brain is lessened, the intensity of the mental states diminished and of shorter duration, consciousness becomes dull and memory distorted. It must be remembered that even though normal activity of the brain, where uniformity of action exists, consciousness tends to disappear. Experiment has shown that reflex and automatic actions are performed more rapidly than conscious acts. For this reason when conscious acts are repeated until they are done very rapidly they do not arouse consciousness. On the other hand, consciousness tends to manifest itself whenever there is diversity of action.. In some cases of epilepsy there are certain facts which go to prove that in a certain measure consciousness is present. For instance, on questioning abruptly during an attack, they will respond but subsequently recollect neither what has been said to them nor what they have themselves answered. In one case mentioned above, whom I had occasion to observe while he walked ten blocks and directed his steps with sufficient discretion to avoid obstacles, there was absolutely no sign of consciousness. All sense perception was absent. In the case of the barber, circumstances tend to prove that consciousness existed, although he gave no answer to the farmer's abrupt approach.

There is another class of cases highly interesting, in which there is immediately associated with the epileptic attack a mental state during which there is derangement of memory, which may manifest itself by oddities and absurd acts, or even crimes. The patient, while advising with his physician, is seized with an attack and recovers immediately, but forgets that he paid the fee a moment before the attack. A clerk finds himself seated at his desk, his thoughts slightly confused but his condition otherwise normal, and recalls having ordered dinner at a restaurant but remembers nothing else. On returning to the restaurant he learns that he has eaten dinner, paid the bill, and left the place without anything unusual occurring. Trousseau relates the case of a magistrate who, while attending a meeting of a learned society in the Hotel DeVille, Paris, went out bareheaded, walked as far as the Quai and returned to his place to join in the discussion without any recollection of what he had done.*

Automatic mental states which occur in epilepsy, especially in the simpler forms, are numerous and more frequently associated with petit mal. This disturbance may precede, follow, or take the place of an epileptic seizure. The writer's cases are unusual from the fact that as far as can be ascertained they were for a period of two years unaccompanied by any other disturbance or ailment and manifested but one attack in two years, making the diagnosis difficult. The importance of correct conclusion is at once apparent, especially when the automatic acts are of a criminal character, and great responsibility rests upon the alienist when giving an opinion as to the accountability of such persons. There is no doubt that individuals in this mental state are irresponsible for their acts. Unfortunately it is practically impossible to demonstrate to the courts by objective tests that an accused person was really in an automatic state, except that it can be shown that external impressions are not perceived by the various paths which together make up general sensibility.

While epileptics generally show some mental failure such as defective memory, irritability, a tendency to become suspicious and revengeful, this was not present in the cases just reported. In every medicolegal inquiry where epilepsy is suspected it is of first importance to establish the existence of paroxysm during which there is disturbed consciousness. If this can be done beyond a reasonable doubt the appearance of convulsions may be expected, and sooner or later mental and moral degeneracy. These conditions are not the actual disease but the outward manifestations of a psychical condition due to disease.

If a person had epileptic convulsions during infancy, or at some period during early life, and a criminal act was committed after some lapse of time succeeding the seizure, and no mental failure is present, the person is in all probability responsible for the act, although it should be recommended that such persons should be under careful observation for a prolonged period before judgment is passed.

It is evident that amnesic cerebral automatism in epilepsy may be the first manifestation of the disorder without any mental deterioration. Persons committing criminal acts during this mental state must be regarded as irresponsible from the fact that this mental aberration may precede the seizure or any definite signs of disordered intellect. Persons committing such acts and raising as a defense ignorance of such acts are entitled to leniency, if there is any reasonable doubt as to their knowledge of such acts.

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*The foregoing three instances are cited by Ribot in "Disease of Memory," 1881.

It would be impossible within reasonable limits to even mention the numerous theories that have been advanced regarding the pathogenesis of cerebral automatism. Suffice it to say that disorders of consciousness are most commonly associated with conditions of general or local circulation and a modification in the nutrition of the cerebral cortex.

According to Hughlings Jackson mental automatism results from the overaction of the lower nerve centers because the controlling influence of the higher centers has been suspended, and we have clinically many illustrations of a well established fact that the excito-motor power of the reflex centers increases when their connection with the higher centers is severed. That the disturbance is localized is very evident from the likeness of all the attacks in the same patient, not only as a whole but in many details, and there is a uniformity in all the paroxysms.

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ORIGINAL ABSTRACTS.

MEDICINE.

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THE CLINICAL EXAMINATION OF THE CEREBROSPINAL FLUID.

Doctor Francis Peyton Rous, of the Pathological Department of the University of Michigan, has recently published the results of his study of the clinical examination of the cerebrospinal fluid, giving particular attention to the technique.* The author's observations may be conveniently grouped under several heads as follows:

(1) *Obtaining the Cerebrospinal Pressure.*—Doctor Rous employed the simple method in vogue at the Johns Hopkins Hospital. As soon as the subarachnoid space is entered, as shown by the appearance of fluid, a thick-walled glass tube of fine bore (one and one-half millimeters diameter), held vertically, is joined to the needle by a short rubber tube. The pressure is measured in terms of the height of the fluid column maintained in the tube. [The tube is marked off in millimeters and must be held with its lower extremity on a level with the spinal canal.] The patient must lie horizontally on his side. Only from one to two cubic centimeters are necessary to fill the capillary. Errors in caliber, et cetera, for practical purposes need not be taken into consideration. The normal pressure with this instrument varies from fifty to three hundred millimeters, and is much wider than those obtained by more complicated ones. Fluctuation in the column is shown with the pulse, change in position, crying, coughing, excepting when the pressure connection between the subarachnoid space and the column in the tube is broken. An increase in pressure is observed in hydrocephalus, brain tumor, meningitis of bacterial origin—especially when acute,—and uremic coma. Low pressures are observed in infants, in conditions giving low blood pressure. After the pressure has been noted the manometer is disconnected and fluid for examination collected.

(2) *Obtaining the Fluid.*—In performing lumbar puncture it should be remembered that when the pressure in the subarachnoid space has been high death may follow the withdrawal of fluid, because of the rapid change in pressure thus produced. Spurting of the fluid should not be an indication for withdrawing a large quantity of fluid, nor slow escape lead to the opinion that pressure is low. The needle should

be fitted with a wire plunger of exact length, which should remain in place until the operator feels that the subarachnoid space has been entered. [Quincke employs a small trocar and canula.] Only hypothetically can a dry tap be conceivable. Unless much care is observed the needle may pass into the peritoneal cavity, or between the bodies of the vertebræ and wound a vessel. Only six cubic centimeters are necessary for complete examination, and in an adult not more than ten cubic centimeters are recommended to be withdrawn for this purpose.

(3) *Cystological Examination.*—Examination of the total number of cells per cubic centimeter is estimated by using a Thoma-Zeiss 1-200† blood pipet. Four parts of a saturated aqueous solution of methyl violet are drawn up to the 4 parts mark and followed by cerebrospinal fluid to the 200 mark. The white cells are thus stained and the erythrocytes retain their normal appearance. *Normally* there are from 1-7 white cells per cubic centimeter. Only lymphocytes and an occasional endothelial cell are found in the absence of disease, and these are often much degenerated. ***Purulent fluid*** is one containing from 4,000 to 40,000 cells per cubic centimeter. In ***tuberculous meningitis*** as high as 2,000 per cubic centimeter may be seen, the average being between 200 and 300. In ***syphilitic meningitis, tabes and paresis*** more than 10 per cubic centimeter and less than 100 per cubic centimeter are usually found. Following closely on a previous puncture an increase in the count is encountered, caused by the injury produced. For ***differential counting*** Doctor Rous advises early and rapid centrifugalization of the fluid for from ten to thirty minutes. Instead of pipeting off the sediment he slowly decants the fluid until the tube is upside down. The sediment clings to the bottom of the tube and is taken up, in a capillary tube, with a last drop that remains, blown out upon converslips, dried, and stained by Wright's method. A simple classification is advised, namely, the percentages of polymorphonuclear, mononuclear, and endothelial cells. The pseudoeosinophile appearance of the neutrophiles must not be mistaken for eosinophile cells, which are seldom seen in great numbers. Accidental red cells do not interfere, if their number, in the blood, as well as the leukocytes is known.

(4) *The Protein Content* is estimated by improvised Esbach tubes, prepared by penciling off a narrow test-tube into lengths to correspond with an Esbach tube. The quantitative relations between the picric acid and the fluid must remain the same as in an Esbach tube. Only crude approximation is claimed for the method. However, it serves to show well the protein modifications. Normal fluids show less than one-half gramme protein (by scale) per litre; tuberculous meningitis from three-quarters to two grammes; purulent meningitis, acute, clogs the tube; syphilitic meningitis, paresis, and tabes may or may not give pathological amounts.

In another paper by the same author[3] his study leads him to the following conclusions:

"(1) The methods described herewith offer the means for a much more careful clinical study of the nonpurulent, cerebrospinal fluid than has heretofore been usual. Determinations should always be made of the pressure in the subarachnoid cavity, of the protein content of the fluid, the number of cells per cubic centimeter, and their kind.

"(2) By these means a specimen may often be pronounced pathological which under the ordinary examination appears normal. Admixture of blood does not necessarily render a fluid valueless.

"(3) Except along the broadest lines there is nothing specific in the permutations of protein, pressure, and cells. But along these lines the fluid from cases of tuberculous meningitis is characteristic, as compared with that from cases of paresis or cerebrospinal syphilis, and these also differ from the normal fluid. If a case be suspected to be one of tuberculous meningitis, but the fluid prove to be normal as regards pressure, protein, and cells, the disease may be ruled out. This rule probably holds absolutely, but it is desirable that more cases be studied before the statement is too strongly made.

"(4) The 'clear elements,' 'cellular degenerations,' 'pseudoendothelial cases, often noted, are definitely proved to be degenerated cells."

D. M. C.

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[1] "International Clinics," Volume II, Seventeenth Series.

[2] *American Journal of the Medical Sciences*, April, 1907.

*Because of the scarcity of literature on this subject and the unsatisfactory methods usually employed in *the examination* of cerebrospinal fluid, the article is abstracted quite fully.

† [The ordinary 1-100 mixing pipet can be used, keeping the proportions the same.]

PEDIATRICS.

ARTHUR DAVID HOLMES, C. M., M. D.

PSEUDOMASTURBATION IN INFANTS.

RACHFORD defines (*Archives of Pediatrics*, August, 1907) pseudomasturbation as a syndrome occurring in infancy and childhood, and described in medical literature as thigh friction and infantile masturbation. It is commonly accomplished with the child lying on its back, thighs flexed, crossed and pressed tightly together, closely embracing the external genitalia. In this position the infant makes a wriggling or up-and-down body movement and rubs its thighs together. In other instances the genitalia are rubbed with hands or against some foreign object. The act is apparently attended with pleasurable excitement. The face is flushed and the general nervous tension is increased, followed by a general relaxation, mild perspiration, quiet contentment and sometimes sleep. It occurs as early as the fourth month, but the average age of onset of this neurosis in the cases presented was sixteen months. In the fifty-two cases reported, forty-eight occurred in female and four in male infants. The much greater exposure of the genital organs of the female to long continued reflex excitation is the most important reason for the great preponderance of pseudomasturbation in this sex.

Among the potent etiologic factors are, habit, environment, heredity, illness, malnutrition, social conditions, et cetera. The irritation of the nervous mechanism which controls the sexual organs is the all-important exciting factor in the development of this neurosis. The site of the irritation is usually in the genitorurinary organs. Irritation and disease of the rectum and lower part of the large intestine may also be direct causes of this condition. Acidity of the urine which irritates, especially the female genitalia, occurred in more than one-third of the cases. Constipation no doubt is a direct cause. Colitis and diarrhea, with the irritation they produce, may be important factors in producing this condition; as also are diseases of the rectum, pinworms, tight clothing, uncleanliness and eczema. In males, adherent prepuce, phymosis, balanitis are direct causes.

The prognosis is good. The tendency is to spontaneous recovery, and time, with normal development of the nervous system, which tends to stability and greater inhibitory control, is the most important factor in the cure. The author says there is almost no relation between this and true masturbation in later life.

The treatment consists in interrupting the habit as early as possible, caring for the child during its waking hours, keeping parts clean, dry, and free from irritating discharges, mild punishment in children of two years, and moral suasion in older children; in some cases forcible restraint may be necessary. Many cases are benefited by bromide of potash and belladonna given at bedtime. A daily bath followed by a cold douche has been used with success. If cases are properly and rigorously cared for a favorable result will follow in practically every instance, though it may require from one to two years to accomplish it.

ORTHOPEDICS.

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ACUTE ANTERIOR POLIOMYELITIS OR ACUTE SPINAL PARALYSIS OF CHILDREN: REMARKS ON THE EPIDEMIC NOW PREVAILING IN NEW YORK.

JOSEPH COLLINS, M. D. (*New York Medical Record,* November 2, 1907) gives a brief history of the epidemics since the year 1843, the time of the first recorded group of cases, together with hospital statistics showing the prevalence of the disease in New York since October 1, 1906, and the most susceptible ages.

The beginning of the epidemic was in August last, and a conservative estimate of the number of cases is placed at one thousand. At the time his contribution was written the number of new cases was falling gradually. But little knowledge has been gained relative to the etiology, except that the predisposing or accessory causes heretofore assigned by previous writers have had very little influence in this epidemic. Much has been gained, however, in study of the clinical history.

The susceptible age is from one to three years, and children previously healthy and strong are oftenest attacked. The amount of muscle atrophy that develops is in keeping with the amount of destruction in the ganglion cells of the anterior horns. The inflammation may attack any region of the cord, but is oftenest found in the lumbar area, next oftenest in the cervical, with a few located in the oblongata and pons. A point of particular interest is the number of recoveries. He considers a case recovered that shows no signs of muscular atrophy, and explains it as due to the fact that inflammation is not severe enough in every case to destroy the cell bodies of the anterior horn, and nutritive processes of the motor neuron.

He urges upon every physician the value and necessity of an early diagnosis with subsequent careful investigation, placing results with some research institution that the causative factor in the disease may be sought for along some definite line.

OTOLOGY.

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INDICATIONS FOR THE MASTOID OPERATION.

Dench (*New York Medical Journal,* Volume LXXXVI, Number XVI) discusses this subject from the standpoint of the general practitioner or general surgeon.

In most cases the signs are apparent, consisting of tenderness over the tip, antrum or emissary vein. Rarely they may be absent and only tenderness on the anterior surface of the mastoid, demonstrated by pressing on the posterior canal wall, or tenderness over the root of the zygoma present.

Edema is more characteristic of furuncle than of mastoiditis, though it should prompt a careful examination for the latter condition. A fluctuating swelling should of course suggest perforation of the cortex. Brawny swelling of the sternomastoid indicates perforation into the digastric fossa and rarely is fluctuating. Any external tumefaction indicates either a very rapidly progressing or a neglected condition.

Tenderness over the tip may be present in acute otitis media, and is not as valuable as it is when found over the antrum. Tenderness itself is not an indication for operation, unless it persists for some time in spite of free incision of the membrane. Recurrence of tenderness is almost pathognomonic of mastoid disease and indicates operation.

The temperature is not a reliable guide, as most extensive disease may be present with a normal chart. Fever is more common in children than in adults.

The blood examination is of little value. In a series of cases quoted the highest leukocytosis was 25,200, and that in a case with marked destruction of the mastoid. In no case, uncomplicated, did the polynuclear average reach eighty per cent, and when this is present it should suggest visceral involvement.

Several cases were reported, each showing some peculiar phase of the disease. M. L. C.

LARYNGOLOGY.

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THE ETIOLOGY AND RECENT TREATMENT OF HAY FEVER.

H. Holbrook Curtis (*Journal of the American Medical Association*, July 13, 1907) comes to the following conclusions after a careful study of the facts:

(1) Hay fever is a disorder amenable to no specific treatment.

(2) The number of cases of hyperesthetic rhinitis from other causes than ragweed and other pollens is about one-third of the total number.

(3) About one-third of the cases supposed to be due to pollen reaction may be relieved by constitutional and surgical methods of treatment. Predisposition to attack in these cases being due to diffinite causes, would suggest the theory that induced enervation of the sympathetic was an important etiologic factor.

(4) Primary intoxications may take place from pollen toxins in cases where the sympathetic system apparently is not previously enervated. These cases, theoretically, should react to antitoxin treatment.

(5) The concensus of opinion today is against the claims made for pollatin, though observers who have been instructed personally by Professor Dunbar indorse unqualifiedly the great benefit to be derived from the treatment.

(6) Medically the suprarenal capsule products hold the first place today in the treatment of hyperesthetic rhinitis.

(7) The importance of constitutional treatment as an adjunct to any local application is of supreme importance.

(8) The best of all treatments yet found is the climatic, with previous attention to nasal conditions.

PROCTOLOGY.

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CANCER OF THE RECTUM.

BEACH (*Proctologist* for March, 1907), from an experience gained from the operative treatment of twenty cases of rectal cancer, pleads for a more careful differentiation of the cases before deciding on radical operative measures. The location of the neoplasm and the stage of the disease must be taken into consideration. In all suspicious or doubtful cases of rectal ulceration, resort to microscopic examination should always be made.

From the fact that fourteen out of his twenty cases occurred in the anorectal region, Beach concludes that extirpation without preliminary colostomy should be the rule in this locality, but should the disease involve neighboring structures by infiltration, associated with pain during defecation, he recommends the establishment of a permanent inguinal anus. He has found the *x*-ray of no value.

After reporting some cases illustrative of his position, he concludes with the following propositions:

(1) That a radical operation for cancer of the rectum is indicated—
  (a) When the disease is not far advanced;
  (b) When the cancer is located in the anal rectum and does not involve neighboring structures.

(2) Cancer of the movable rectum should be classed as inoperable as far as results are concerned.

(3) In high up cancer, colostomy offers the best results.

(4) Complications of metastasis and mechanical obstruction indicate colostomy.

DERMATOLOGY.

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MYOMATA CUTIS.

HEIDINGSFELD (*Journal of the Americal Medical Association*, Volume XLVIII, Number VII) reported two cases of myomata cutis. The disease is characterized by the formation of lesions, varying in size from a millet seed to a hazelnut, found upon limited areas of a portion of the trunk or face, or one of the extremities. In color they vary from red, brown, yellow, blue, purple dark colored to translucent or colorless. Many are accompanied with marked dilatation of the superficial capillaries and veins, so much so that frequently the diagnosis at first is often confused with that of angioma, or cavernous angioma. Sections of the lesions show a reduplication of the involuntary muscular fibers of the skin. There is usually severe paroxysmal pain, sharp, lancinating, vice-like in character, which may appear spontaneously, or be induced by physical exertion, temperature changes, or local pressure. However, the clinical manifestations are so varied that the diagnosis is uncertain without histologic confirmation.

Heidingsfeld's first case was a male, age thirty-six, presenting a painful lesion over the left knee which he had had for some nine years following an injury by a fall. Histologic examination in this case showed areas of dense masses of interwoven bundles of involuntary muscular fibres, distributed for the most part in the superficial layer of the cutis, extending to the epidermis, invading the papillæ and entirely obliterating the latter over large areas by pressure atrophy. Elsewhere in the deeper layers of the corium were areas which consisted of closely aggregated vessels, with their widely distended lumina surrounded by thin walls, filled with circulating blood, or walls thickened with extensive endothelial proliferation, having the character of well preserved mononuclear lymphocytes, until the lumen was partially or completely occluded. Hair follicles and sweat glands were well preserved, but there was no evidence of sebaceous glands.

The second case was a female, age ten years, having a nevus situated over the left portion of the forehead, face, neck, and left ear, present from birth, which had not changed materially. The lesions on the forehead were linear and grouped into a small area; others consisted of rounded macules, and varied in size from a pinhead to a split pea, varying in color from purplish to red, and telangiectic in character. Some two months later the lesions had multiplied enormously in number, extending over the left shoulder and down the chest as far as the nipple. Pain was absent.

A detailed histologic finding is given. All the diversified clinical and physical phenomena find their best explanation on the basis of some such unknown influence, which stimulates the involuntary muscular tissue of the skin to a preponderating development and overgrowth, irrespective of age, area, predisposing causes, and similar inconstant conditions. The tendency may be inherited, and called into activity by the influences of puberty, trauma, et cetera. J. F. B.

INJECTIONS OF PARAFFIN.

An editorial in Volume XLVIII, Number XX, of the *Journal of the American Medical Association,* entitled "A Remote Danger of Paraffin Prosthesis," calls attention to the danger of an ultimate development of tumors of varying sizes at the sight of the injection, and some cases are reported where, after intervals of varying lengths of time, elevated tumors appeared, some bearing a resemblance to keloids; the masses are hard and dense, and overlying skin purplish. Sections showed a connective tissue overgrowth with many giant cells and other evidences of chronic inflammatory process.

The formation of such tumors is an accident which cannot be foreseen or guarded against, and should always be taken into consideration as one of the possibilities of treatment before paraffin prosthesis is attempted. J. F. B.

RADIOLOGY.

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THE USE AND ABUSE OF SKIAGRAPHY IN FRACTURES AND DISLOCATIONS.

In the discussion of this somewhat old but still timely subject, Doctor John Goland (*Archives of the Roentgen Ray,* Number LXXXI, October, 1907) first considers the still common questions of whether or not skiagraphy has afforded us a clearer knowledge of fractures, a better diagnosis and consequently a better and more efficient method of treatment, and answers each one affirmatively—with the reservation that a proper and scientific observation is necessary:

This writer reiterates the statement made by many experienced clinicians, that in order that a correct diagnosis may be made, the diagnostic plates should be the work of an experienced radiographer, skilled in the use of Roentgen apparatus, in a knowledge of anatomy, and in the interpretation of radiographs.

"Skiagraphy must be employed in the treatment of fracture by every conscientious and careful surgeon, however great may be his skill in diagnosing these lesions by older methods. However, the use of *x*-rays does not supersede the ordinary methods of clinical diagnosis; it supplements them in a most valuable way, especially where great swelling of the soft parts exists. It makes the presence of a fracture clear where otherwise doubt might exist. It is now common knowledge that many fractures of the carpus, phalanges, metatarsus and elbow-joint were almost entirely unrecognized before Roentgen's discovery."

Correct interpretation, when one has shadows only to consider,—a record of densities,—which may vary with the technique employed, is quite another thing from correct interpretation of physical changes in the patient's anatomy, as determined by inspection, palpation, or manipulation. One must realize that the skiagraph is very different from a photograph or a naked eye appearance of the same bone. The interpretation of a skiagraph is unquestionably more difficult than that of a photograph. The difficulty of correct interpretation is lessened if we have for comparison the shadow of a normal bone in exactly the same position. The author then points out the necessity of certain standards of distance, position, and other points of technique.

The use of the radiograph in the treatment of fractures, to determine the apposition, especially in revealing the presence of osseous tissue following the reduction of a comminuted fracture, is of especial value. The stereoscopic method should always be employed where possible.

The medicolegal aspects of Roentgenology are next touched upon, and the author points out that to the inexperienced a slight deformity, which does not in the least interfere with normal function, may be greatly exaggerated. An epiphyseal separation may be mistaken for a fracture, and in rare instances the radiograph may fail to show a fracture which is clearly manifest by clinical signs.

In concluding his general remarks the author emphasizes the fact that skiagraphs themselves, without a knowledge of technique, and without surgical interpretation, may be absolutely of no value, and indeed may be positively misleading.

NEUROLOGY.

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DISSEMINATED PERIPHERAL NERVE-IRRITATION AND NERVOUS EXHAUSTION.

Klingmann (*Journal of the Michigan State Medical Society*, September, 1907) speaks for more thorough examination of the "neurasthenic," and bases his paper on three hundred fifty cases of general "nerve-irritability." The author divides these into three groups, as follows:

(1) Those patients suffering from a combination of mental and physical weakness and irritability, general hypersensitiveness and a reduction of all forms of nervous energy which tend to persist indefinitely and do not yield readily and relapse frequently.

(2) Those cases in which a combination of abnormal motor, sensory and trophic phenomena exist in consequence of morbid changes in the peripheral nerve-trunks.

(3) A class of patients that have definite and constant subjective symptoms depending upon a localized peripheral nerve-irritation, resulting in nervous exhaustion which yield readily to treatment.

He gives detailed clinical history of four cases in support of his contention. The etiology and pathogenesis are considered, and his ideas are set forth in his concluding paragraph:

"Whether these cases should be all classed under the one general head of neurasthenia is of secondary importance as long as we do not consider them clinically and pathologically as a unit. It is of more importance that we consider them individually according to the symptoms and their pathologic basis. It is, however, proper to assume that the symptom-complex of the cases which the author has placed in the first division is a direct expression of a particular state of neuropathy; it is the primary condition, and neither disturbance of digestion, defective elimination nor autointoxication have the general importance that some authors have endeavored to ascribe to all cases of neurasthenia." I. H. N.

THE NEED OF POPULAR LECTURES ON INSANITY.

Stedman (*Boston Medical and Surgical Journal,* October 10, 1907) emphasizes the importance of educating the public on insanity, and gives a few outlines for the adoption of a plan. Although the idea, as the author says, is not new, it brings before us vividly the importance of acquainting the public with the principals of a subject on which they have vague ideas. The article should be carefully read by every alienist and practitioner. I. H. N.

DIAGNOSTICS.

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SOME MOTILE ELEMENTS SEEN IN CERTAIN CEREBROSPINAL FLUIDS.

Eve (*British Medical Journal,* Number MCCXLVI, 1907) describes certain actively motile filaments resembling *Spirochaeta pallida* in cerebrospinal fluids. They were generally accompanied by large numbers of small (two to five microns) hyaline, globular bodies, also actively motile, many of which had short, stumpy filaments. Both filaments and globular bodies were found in the centrifugalized spinal fluid of ten cases of general paresis. Eve considered the filaments as spirochaeta and the hyaline, globular bodies as protozoal (probably from contamination), until he chanced to see the filaments formed from white blood cells, during their degeneration. The process is described in detail with illustrations. Its essential features are, *first,* a protrusion of a knob-like process from the cell, which shortly elongates and becomes filamentous. It is very actively motile. Other knob-like processes have meanwhile appeared at the periphery of the white cell. In about twenty-four hours the filaments have become beaded, shortened and less motile. *Secondly,* there is a separation of the beaded filaments from the cell. They float free in the surrounding fluid, still retaining some motion. Finally, the "beads" become detached from the filaments, and appear as the hyaline, globular bodies above described. Neither filaments nor hyaline bodies take ordinary stains. Their motility is not altered by warming the stage of the microscope. Eve summarizes his observations by attributing the motility of filaments and hyaline bodies to Brownian movements. He thinks that the occurrence of these bodies might prove of clinical value, when found in freshly drawn spinal fluid, as affording evidence of cell degeneration. It would seem that the filaments might be readily mistaken for *spirochaeta pallida* if the preparations were not stained.

INTERPRETATION OF THE POSITIVE VENOUS PULSE.

Hewlett (*Journal of Medical Research,* Volume XII, new series—1907), after reviewing the commonly-held opinions as to the causation and interpretation of venous pulsations in the neck, in health and disease, concludes that:

A positive wave in the venous pulse during ventricular systole may be due to at least three different causes: (a) simultaneous contraction of the auricles and ventricles; (b) tricuspid insufficiency; (c) paralysis of the auricles.

Simultaneous contraction of the auricles and ventricles causes or tends to cause the "v-wave" to disappear from the tracings, owing to auricular diastole.

Tricuspid insufficiency causes a large "v-wave," which appears abnormally early. In marked cases there is a gradual ascent in the tracing from the auricular wave to the summit of the "v-wave."

In absolutely irregular pulses, the auricles have ceased to contract. The positive venous wave of early ventricular systole is produced by the contraction of the ventricle and is transmitted unchanged through the motionless right auricle to the veins of the neck. Normally, this wave is taken up by the dilating auricle.

Tricuspid insufficiency does not necessarily accompany auricular paralysis, and when it does so its diagnosis is difficult, for the reason that in both conditions the "v-wave" appears early owing to the excess of blood in the right auricle.

The writer submits a number of fair tracings to illustrate his views.

A NEW SPHYGMOMANOMETER.

M. Vaquez (*La Presse Medicale,* August 10, 1907) describes a new form of apparatus for the automatic recording of blood pressures. He calls it *"sphygmosignal."* The apparatus is, essentially, an armlet, similar to those of the Riva-Rocci type of manometer, connected with a mercury bulb and tube after the fashion of the Potain instrument, The new feature introduced by M. Vaquez consists in an oscillating indicator, which becomes immobile just as soon as the radial pulse is lost. In this manner, instantly and accurately, the pressure reading is automatically registered, when the arm cuff has been inflated sufficiently to obliterate the radial. The main advantage of the new form of sphygmomanometer appears to be that by its use the subjective element in reading is done away with.

THERAPEUTICS.

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HOT AND COLD APPLICATIONS IN MEDICINE.

Blackburn (*Therapeutic Gazette*, July, 1907) considers the physiologic action and the general principles of the application of heat and cold used for remedial purposes. He begins by stating that heat and cold are not two distinct forces, but are relative strengths of the one force, caloric. As used in his article he defines cold as something that abstracts heat from the body, and heat as something that communicates heat to the body.

Upon the nervous system heat is first an excitant and later a sedative and depressant. Long immersion of the whole body in warm water produces muscular weakness, languor, nervous depression, drowsiness and finally convulsions and coma. The brain and nervous system become anemic.

Upon the heart heat produces an accelerating effect that is governed in extent by the degree to which the superficial blood-vessels are dilated. At the same time the respirations are first quickened and then slowed. The secretions of the kidneys and the salivary, sudorific and intestinal glands are all increased.

Cold applied to the skin, in whole or in part, causes a congestion of the superficial vessels, which is soon followed by contraction of the tissues affected with a lowering of temperature both local and general. When the functions are active and the exposure has not been excessive, reaction with redilatation of the capillaries and the return of heat occurs. When the functions are not active reaction either is delayed or does not occur at all. Prolonged exposure to cold causes local and general syncope and devitalization. Cold is used therapeutically either for its effect on the nervous system, blood-vessels and cells of the body, or for the purpose of extracting heat from the body. It is antispasmodic, anodyne and anesthetic.

Of the conditions in which general hot baths are commonly used mention is made of the following: Acute and chronic poisonings and intoxications, dyscrasias of various kinds, nephritis, gout, rheumatic and arthritic conditions, skin diseases, eruptive diseases, chorea, convulsions, insomnia, cardiac diseases, collapse and acute colds. Local conditions in which local or general hot baths are employed are myalgia, neuralgia, gall-stone colic, nephritic colic, meningitis, intestinal colic, pneumonia and pleurisy. Cold may also be used in several of these conditions especially as an antipyretic.

Hot baths may be Turkish, Russian, sponge, pack, hot dry air, hot moist air, and in addition, for local use, mud, sand, salt, fango and electric. Much harm may result from Turkish and Russian baths. Temporary improvement may be followed by disadvantage owing to overstimulation. Local baths usually do good and can cause no harm. The chief benefits obtained at watering places comes from a combination of hydrotherapy, diet, exercise and accessories, such as massage, electric treatment, et cetera.

Cold baths are utilized to reduce temperature, to correct nervous disturbances, to strengthen the circulation and respiration and increase kidney secretion. Vogel's statistics are quoted to the effect that during a period of fifty years typhoid fever at the Munich military hospital has shown a reduction of mortality to two and seven-hundredths per cent by the cold bath treatment as compared with twenty per cent mortality by other methods.

EDITORIAL COMMENT.

THE CALMETTE TUBERCULIN CONJUNCTIVAL TEST.

THE ophthalmo-reaction introduced by Calmette for determining the existence of doubtful tuberculous conditions is arousing considerable enthusiasm by reason of the claim that positive diagnosis is established thereby. This valuable diagnostic innovation, which is an outgrowth of von Pirquet's subcutaneous test, consists in instilling tuberculin into the eye. In tuberculous subjects a characteristic reaction is produced in the conjunctiva in from three to five hours, the acme of the test being attained in from six to seven hours. The condition usually presented is congestion and edema. The former gradually assumes a diffuse redness, which, together with the latter, uniformly recedes in adults in from twenty-four to thirty-six hours, this period being shortened to about eighteen hours in children. The preparation employed by Calmette is a one-per-cent solution, made by precipitating the dry tuberculin with alcohol at a temperature of 95°, in distilled and sterilized water. The glycerin content of ordinary tuberculin, which is irritant, militates against the employment of this brand. Because of the prominence accorded this convenient procedure the internest should become acquainted with conditions present in the eye which bring about a marked reaction independently of the incentive contemplated in the Calmette rendering lately reported in this journal.

* * *

Stephenson announces observations[1] on the occurrence of the ophthalmo-reaction in certain more or less common eye affections which comprise a definite group of diseases generally thought to be attributable to causes other than tuberculosis. This clinician is inclined to admonish that great care be exercised in making the test, and advises such precautions as confining the patient in bed, the taking of systematic temperature and weight records, and the determination of the tuberculo-opsonic index. "These requirements," the author states, "stand in the way of the everyday use of the test as a diagnostic agent." Attention is directed to the fact that in chronic iridocyclitis, scleritis, and some forms of choroiditis, usually attributable to syphilitic infection, the reaction is commonly present, and hence the importance of detailing the results obtained by the author from practical experience in this direction:

(1) Phlyctenular conjunctivitis and keratitis (usual view—due to tuberculous toxins circulating in the blood stream): six children; all positive.
(2) Choroiditis: three cases; all positive.
(3) Interstitial keratitis (usual view—due to syphilis): eight cases; five manifested typical signs of syphilis; three gave positive reactions.
(4) Episcleritis: three cases; one positive, two negative.
(5) Tubercle of iris: one case; positive.
(6) Tubercle of cornea: one case; positive.
(7) Chronic iridocyclitis: two cases; two positive.

A few acid-resisting bacilli are reported in the aqueous humor of one of these cases on puncture.

* * *

The results obtained by Calmette seem abundantly confirmed—in a series of over one thousand cases since his first paper on this subject appeared—to establish the reaction as a definite phenomenon occurring in individuals suffering from either incipient or advanced tuberculosis in any part of the body. However, the fact is well known that tuberculosis of the structures of the orbit may obtain independently of tuberculous disease elsewhere in the economy, and therefore the importance of recognizing eye affections of this nature will be apparent before reposing too much confidence in the test as indicative of tuberculous disease in other organs.

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[1] *British Medical Journal.*

ANNOTATIONS.

A NEW SPECIALTY IN OPERATIVE SURGERY.

Doctor John B. Roberts recently made a plea, before the Philadelphia County Medical Society, for a new specialty in surgical practice—the evolution of expert anesthetists. Instruction in this branch of practice is altogether inadequate, and the contention was advanced that many deaths on the operating table, attributed to shock, were in reality the result of excessive anesthesia from ether or chloroform. While improved technique and aseptic methods have decreased the number of deaths from major operations, equal progress is not in evidence regarding care and discrimination in the employment of anesthetic agents. Many of the smaller and private hospitals have expert anesthetists, but this custom does not obtain in American institutions generally, the mechanical details incident to the operation being considered of more importance than the ministration of the anesthetic to the patient. The observer was of the opinion that general anesthesia is too commonly employed and that many operations could be performed by purely local insensibility, recourse to which is now sadly neglected.

ALBUMINURIA RESULTING FROM ATHLETIC EXCESS.

COLLIER, of the University of Oxford, who has had wide experience in the examination of athletes, comments on the prevalence of functional albuminuria in men who indulge in excessive physical exertion. This condition, the observer concludes, is the result of weakness of the renal blood-vessels, aggravated by undue strain, and students evidencing this dyscrasia are urged to indulge in sports of mild form. These men are not chronically afflicted with albumin in the urine, but only manifest the symptoms after exertion.

MEDICAL STUDY FOR MERCENARY GAIN.

THE fallacy of pursuing medical study for purely mercenary gain, and with the idea of enjoying a life of affluence, is evidenced by various statistical tables. Indeed the income of the average practitioner in this country is meagre enough, but the position of the European physician, as regards pecuniary recompense, is not calculated to incite envy. Austria has 9,204 general practicians, and of this number 6,388 make less than £50 per annum above expenses. In France the condition is said to be even worse, and in no European country is the average physician able to show a comfortable profit after expenses are liquidated. In England conditions are somewhat better, and carefully compiled statistics show that the average English doctor's income is between £220 and £250.

A SHOWING WITH OPSONINS IN PRIVATE SERVICE.

TURTON has prescribed opsonic therapy for seventeen patients suffering from tuberculosis of varying degree. The treatment was administered in private practice, which excluded the advantage of laboratory equipment, and was continued in each case for six months. Considering the difficulties under which the experimenter worked, and the fact that a majority of the patients were compelled to perform routine duties, which militated greatly against favorable effect, the outcome was indeed gratifying. Injections of Koch's new tuberculin were employed and charts showing the rise and fall of the opsonic index were factors of subjective detail. In five of the patients the disease had progressed to the stage wherein treatment was unavailing, but the clinical results in the remaining dozen were a diminution of the evening temperature, return of appetite, increase in weight, and improvement in general health.

CONTEMPORARY.

MEDICAL BOOKS AND BOOK REVIEWS.

[BOSTON MEDICAL AND SURGICAL JOURNAL.]

It is commonly said, and often rather thoughtlessly, that too many medical books are written and that in many departments of medicine there is no present need of further additions. It should be remembered by such critics that many books must always be written before one of marked superiority emerges to be generally accepted as authoritative. It is true of medical books as of other departments of human endeavor that there is room at the top and comparatively little anywhere below. The natural result is that many medical men endowed with a legitimate amount of self-confidence believe that they are capable of presenting a subject in a more attractive or a more conclusive form than has hitherto been the case. This attitude of mind is certainly salutary, and, in fact, indispensable to progress. If prospective writers of medical books were to abstain from the effort to put their ideas into words for the benefit of others, through modesty or the recognition that other books had been written on the same subject, it is not likely that the need, which now and always has existed, of excellent text-books would be met. A far safer course of action is to encourage by all legitimate means the writing of books in the hope that from the mass of possible mediocrity an occasional work of real significance, either from the didactic or the research point of view, will emerge. The competition among books is just as healthy a tendency as that in the industries in general. It would be altogether unfortunate if certain men or groups of men wrote all the books and were regarded as having a right to dictate to the rest of the medical profession in this regard. With the general and widespread competition which now exists, it is perfectly evident that the good books and those which are useful, whether to students or to men already in practice, will survive, whereas the others will sink into oblivion, which many of them very possibly deserve. The process at least is a natural one, and one which certainly should not be discouraged by the continued assertion that we have too many books and that the same ground is covered again and again.

An analysis of the reviews of medical books, appearing in medical journals, is also of interest. It is to be remembered that under the influence of modern specialization books in any one department of medicine are ordinarily reviewed by experts in those departments, men for whom the book under consideration may present nothing new, and to whom it very naturally appears commonplace and unnecessary. The object of the ordinary text-book, however, is not to appeal to specialists, but rather to present special subjects in a form accessible to and readable by practitioners in other departments of medicine. It is, therefore, absurd for a reviewer of a book, for example, on the eye, or the ear, or internal medicine, to assert that the volume is unnecessary and not needed simply because it reiterates what he already knows and what, in fact, may be common knowledge to those versed in that particular branch of medicine. Such criticism is both superficial and meaningless. What the critic of such a book should determine is whether it presents knowledge in a systematic fashion, with accuracy, and in a manner to appeal to the ordinary reader. These are the qualities which justify the production of new books, however much the subjects may have been traversed before and however elementary they appear. As medicine develops and subdivides, there is evidently increasing need for simple and succinct statements of well recognized facts. It is proverbial and certainly true that to write a concise book on any subject is a far more difficult task than to elaborate a monograph. Selection is a peculiarly difficult task, and one which should always be commended, if well done.

These points book reviewers in general frequently overlook. We have sometimes thought that it might be well if three-quarters of the medical books were sent for review to those who in the future are going to use them. There is no question that the estimate of a book at the hands of an expert in the subject under consideration would be far different from that of a practitioner who in the endless details of his practice is eager for a clear and even commonplace presentation of the subject. Much illiberality in the reviewing of books is apparent. They are dismissed often wth a few words and with insistence on the fact that they are superfluous. It would be well to recognize the palpable fact that what is superfluous for one man is a necessity for another, and that many text-books are good just in proportion to the number of physicians they benefit. For our part we welcome new books, recognizing that some of them are excellent and most of them useful. We are strongly disinclined to condemn a book simply because it is a repetition of what has already been said. On the contrary, every encouragement should be offered to writers of books in the hope that ultimately results will appear which could be obtained by no means requiring less active competition.

MEDICAL NEWS.

THE MICHIGAN DENTAL LAW.

An act to provide for the examination, regulation, licensing and registration of persons engaged in the practice of dentistry, and for the punishment of offenders against this act, and to repeal all acts and parts of acts in conflict herewith.

The People of the State of Michigan enact:

Section 1.—It shall be unlawful for any person not a registered dentist within the meaning of this act, to practice dentistry or dental surgery in any of its departments, as principal or agent, in the State of Michigan, except as hereinafter provided.

Section 2.—From and after the passage of this act, the State Board of Dental Examiners herein provided for, shall consist of five members, to be appointed by the Governor. The members of the board created by act number one hundred forty of the Public Acts of eighteen hundred eighty-three, entitled "An act to regulate the practice of dentistry in the State of Michigan," holding office at the time of passage of this act, shall be continued in office as members of the State Board of Dental Examiners until expiration of the term for which they are appointed. The additional members of said board shall be appointed for such periods that the term of office of one member of said board shall expire annually, and annually on January one thereafter, the Governor shall appoint a member of said board whose term of office shall be for a period of five years. The several members of said board shall hold office until their respective successors are appointed and qualified, and if any vacancy occurs in said board, another shall be appointed as aforesaid to fill the unexpired term thereof. The members of said board shall be electors and reputable dentists and graduates of a reputable dental college, who have resided in this State for at least five years and have had at least five years' experience in their profession. Said board shall have full powers to make by-laws and necessary regulations for the proper fulfillment of their duties under this act. It shall choose one of its members president and one secretary-treasurer, and shall hold two regular meetings each year, at such dates and places as may be deemed best. Special meetings may also be held. A majority of the board shall constitute a quorum for the transaction of business. Said board shall keep a full record of its proceedings and a full registry of all persons licensed and certified as dentists by said board, which shall be public records, and at all times open to inspection as such. A transcript of any of the entries in such record, certified by the secretary-treasurer under the seal of said board, shall, at all times and places, be competent evidence of the facts therein stated. The members of said board shall have the power to administer oaths and hear testimony in all matters relating to the duties imposed upon it by law. Said board shall make an annual report of its proceedings to the Governor on or before the thirty-first day of December in each year.

Section 3.—All persons who desire to begin the practice of dentistry in this State after the passage of this act, and who shall have a license from the dental board of another state, or who shall have received a diploma from the faculty of some reputable dental college duly organized under the laws of this or any other State of the United States, shall have the right to apply to the dental board of this State for examination as to their proficiency; and all successful applicants shall be licensed and registered by said dental board: Provided, Nothing in this act shall deprive a candidate who has already appeared before the Board and failed on examination from the privilege of re-examination. Said dental board shall be authorized to ascertain and determine what shall constitute a dental college or institution in good standing and repute; but no such dental college or dental institution shall be considered reputable unless the same shall possess the following qualifications:

First, It shall be chartered under the laws of the State in which it is located and operated, and shall be authorized by its charter to confer the degrees of Doctor of Dental Surgery or Doctor of Dental Medicine;

Second, It shall deliver, annually, a full course of lectures and instructions by competent faculty and corps of instructors in the following subjects: Anatomy, chemistry, physiology, histology, materia medica, therapeutics, dental metallurgy, pathology, bacteriology, operative dentistry, prosthetic dentistry, crown and bridge work and oral surgery and hygiene, said course of instruction to consist of not less than three terms in separate academic years, and of not less than thirty-two weeks of six days for each session, and shall require its matriculates to have a general education equivalent to that required for graduation from a high school of recognized standing;

Third, The apparatus and equipment of each said dental college or institution shall be ample and sufficient for the ready and full teaching of the above named subjects, and every such college shall allow said State Board of Dental Examiners of this State the privilege of inspecting its work and equipment at any time.

Section 4.—Said dental board shall have power, after due notice in writing for twenty days and upon a full hearing at a time and place fixed in said notice, to revoke and annul any original license or registration for fraud, deceit or misrepresentation in the practice of dentistry, or for gross violations of professional duties. Nor shall said dental board relicense any one whose license has once been revoked for any of the above causes within one year after such revocation, and then only upon sufficient assurance and guarantees to said board of correct conduct for the future. The notice hereinbefore provided to be given may be served by registered letter mailed to the address of the dentist under investigation, and when the whereabouts of any such person is unknown, then said notice may be sent to the last known address of such person.

Section 5.—All persons entitled to examination as provided in this act shall file application and license in writing, supported by affidavit, stating the facts which entitle him or her to such examination, and each applicant shall accompany his or her application with such license or diploma for verification as to its genuineness. All applicants for examination shall, at the time of making such application, pay to the secretary-treasurer of the dental board, a fee of twenty dollars, and each applicant shall present himself before the said dental board for examination at the first or second regular meeting after his application shall have been made, and in default thereof, said fee shall be forfeited to said dental board. The fee for any subsequent application for examination or re-examination shall be ten dollars. The examination may be written or oral, or both, at the option of said board, and shall include the following subjects: Anatomy, chemistry, physiology, histology, bacteriology, operative dentistry, prosthetic dentistry, crown and bridge work, and oral surgery and hygiene. All persons of good moral character, who shall successfully pass such examination, shall be licensed and registered by said dental board and shall receive a certificate of such license and registration duly authenticated by the signature of the members of the board, and with the seal of said board attached; and in no case shall said examination fee be refunded, but said dental board may, for sufficient cause, remit said fee for subsequent re-examination.

Section 6.—No person having received a certificate from the State Board of Dental Examiners in the manner hereinbefore provided, shall engage in the business of a dentist in any county of the State in which he shall locate, or into which he shall afterwards remove, until he shall have had such certificate recorded in the office of the county clerk of such county, and it is hereby made the duty of the county clerk to record such certificates in a book provided and kept for that purpose, and the clerk is authorized to charge a fee of fifty cents for recording such certificate, to be paid by the person offering such certificate, for record. The record of each certificate required by this act, or certified copy thereof, shall be evidence in all courts that the person holding it is a registered dentist within the meaning of this act. It is hereby made the duty of each county clerk in the State to furnish the Sate Board of Dental Examiners on the first day of July a list of all dentists registered in his county during the preceding year, this report to be made on tabulated blanks to be sent to said county clerk for the purpose. The register of the county clerk shall be open to public inspection during business hours. Any failure or neglect or refusal on the part of any person holding such certificate to register the same with the county clerk as above directed, for a period of six months, shall work a forfeiture of the certificate. In order that a complete register of all the dentists practicing in this State at the present time may be made, within sixty days after this act takes effect, it shall be the duty of every dentist at present practicing in the State, whether legally licensed at present or otherwise, to forward to the Board of Dental Examiners an affidavit setting forth the facts of his registration or the credentials upon which he may claim re-registration. This application shall be accompanied with a fee of three dollars, which shall be deposited in a special fund to be used only by the Board of Examiners for the enforcement of this act against unlicensed or unregistered practitioners. No license or certificate of registration when once forfeited, for any cause, shall be registered, except upon payment to the said Board of Dental Examiners of the sum of twenty-five dollars as a penalty for such neglect, failure, refusal or misconduct.

Section 7.—All persons shall be said to be practicing dentistry within the meaning of this act, who shall use the words or letters "Dentist," "D. D. S.," or any other letters or title in connection with his name, which in any way represents him as engaged in the practice of dentistry, or who shall advertise or permit it to be done by sign, card, circular, handbill, newspaper or otherwise, that he can or will attempt to perform dental operations of any kind, treat disease or lesions of the human teeth or jaws, or replace lost teeth by artificial ones, or attempt to correct malposition thereof, or who shall for a fee, salary or other reward, paid or to be paid, either to himself or to another person, perform dental operations of any kind, treat diseases or lesions of the human teeth or jaws, or replace lost teeth by artificial ones, or attempt to correct malposition thereof. But nothing contained in this act shall be taken as applying to the acts of legally qualified physicians in the extraction of teeth, in the performance of their duties as such, or to acts of bona fide students of dentistry done in the college building, in the pursuit of clinical advantages while in attendance upon a regular course of study in a reputable dental college. Any licensed dentist, proprietor, partnership, association or corporation owning, running, operating or controlling any room or rooms, office or dental parlors, where dental work is done, provided or contracted, who shall employ, keep or retain any unlicensed dentist or student as an operator shall be guilty of a misdemeanor and punished as provided in section nine.

Section 8.—Out of the funds coming into possession of said board as above specified, the members of said board may receive as compensation the sum of ten dollars for each day actually engaged in the duties of their office as such examiners and actual necessary expenses. Said expense shall be paid from the fees and assessments received by said board under the provisions of this act, and no part of the salary or expense of said board shall ever be paid out of the State treasury. All moneys received in excess of said per diem allowance and mileage as above provided for, shall be held by the secretary-treasurer of said board, as a special fund for other expenses of said board and for carrying out the provisions of this act. The secretary-treasurer of said board shall from time to time, give such bond for the faithful discharge of his duties as the custodian of funds of said board as it may direct. Said board shall appropriate from any fund under its control, a sum of not to exceed five hundred dollars annually as compensation for the services of the secretary-treasurer.

Section 9.—Any person who shall practice, or attempt to practice dentistry either as proprietor, employee or assistant, without having a license, or without having his license renewed as provided by section seven of this act, or without keeping his license in open view in his operating room, shall be punished by a fine of not less than fifty dollars nor more than two hundred dollars, or by confinement in the county jail not less than twenty days, or by both such fine and imprisonment. It is hereby made the duty of the prosecuting attorney of each county in the State to prosecute every case to final judgment, whenever his attention shall be called to a violation of this act.

Section 10.—An applicant shall be registered and given a certificate of registration if he or she present a certified copy of certificate of registration or license which has been issued to said applicant in any other state or foreign country where the requirements for registration shall be deemed by said board to be equivalent to those of this act. Provided, That such country or state shall accord a like privilege to holders of certificates from this board. The fee for registration of applicants of this class shall be ten dollars, to be paid at the time of application.

Section 11.—Any person filing, or attempting to file, as his own, the diploma or license of another, or a forged affidavit of identification or qualification, shall be deemed guilty of a felony, and upon conviction thereof, shall be subject to such fine and imprisonment as is made and provided by the statutes of this State for the crime of forgery.

Section 12.—Act number one hundred and forty of the Public Acts of eighteen hundred eighty-three, and all acts or parts of acts in any way contravening the provisions of this act, are hereby repealed.

This act is ordered to take immediate effect.

[In effect June 28, 1907.]

MINOR INTELLIGENCE.

ACCORDING to report plague is active at Osaka, Japan, and Constantinople is in the throes of a cholera epidemic.

THE Government of British Columbia is contemplating the establishment of an asylum at Coquilan to accommodate two hundred patients and cost $200,000.

FOUR cases of smallpox, three of them in Divinity Hall, have been reported from the University of Chicago. The authorities have ordered all students to be vaccinated.

AN annuity of $300 is to be paid to physicians in Austria who have devoted thirty years or more of service as health officers or public vaccinators. This provision was recently made by the Diet of the Lower House.

MUCH discussion is rife in New Orleans concerning the attitude of the authorities at Tulane University in refusing women the privilege of co-study with men in the pathologic and anatomical laboratories, and in abdominal surgery and the therapeutics of diseases peculiar to the sexes.

THE Red Cross Society of France was recently the recipient of several tracts of land, terraces, villas, and gardens, amounting in value to over four million francs. The acquisition will be utilized as a home for sick and wounded officers.

BY a vote of thirty-six to one the Illinois State Senate recently passed a bill giving the Board of Health full power to regulate and control medical colleges, and to determine the educational requirements necessary for admission thereto.

MASSACHUSETTS has a law against the distribution of medicinal samples to the laity. Four men engaged in this work were recently arrested in Boston. These are the first arrests under the law, which was passed by the last legislature.

THE death is reported of Doctor Eduard Hitzig, Emeritus Professor of Psychiatry in the University of Halle, at the age of seventy years. Professor Hitzig was a prominent figure in German medicine, and was long engaged in psychiatric investigation.

DOCTOR THEODORE GROSSE, of Germany, is accredited with the discovery of a new element. By combination of heat and electricity he is reported to have obtained from platinum an unknown substance, having none of the properties of plantinum.

DOCTOR JOSEPHINE KINGSLEY died recently of heart disease at San Antonio, Texas, aged sixty-three. She was a graduate of the University of Michigan, class of 1873, and was for many years connected with the Women's Hospital, Detroit.

THE Austrian Minister of Education recently ordered the authorities of the various medical schools to admit women to study on the same basis as men. Positions as clinical teachers, assistants to professors, and lecturers are likewise within the grasp of women.

PATENT medicine traffic in Germany is indeed in a sorry plight. In 1903 the government decreed that proprietors publish formulæ, but the death knell of the industry seems to have been sounded recently by an act prohibiting laudatory advertising of patented medicinal products.

THE death of Mr. Timothy Holmes, editor of Holmes' "System of Surgery," is reported from England. Mr. Holmes was one of the foremost surgeons of the British Isles, was for many years Hunterian lecturer on surgery in the Royal College of Surgery, and during his professional life was connected with Saint George's Hospital and Medical School.

WHILE performing autopsy on the body of Daniel Ryan, a watchman in New York City, the physicians—Doctors O'Hanlan and Larkin—discovered what is believed to be the smallest brain by weight ever observed in an adult manifesting average intelligence. The organ weighed only twenty-four ounces, but the convolutions and histologic structure were normal.

RECENT LITERATURE.

REVIEWS.

DIE THERAPEUTISCHEN LEISTUNGEN DES JAHRES, 1906.*

THIS volume is a good example of the excellent work done in the preparation of year-books by the Germans. It covers the contributions to therapeutics with great thoroughness, so far as German literature is concerned. The arrangement is alphabetic, methods of treatment and diseases being arranged under a single alphabet. The abstracts are usually brief, but long enough to be helpful in practice, and the sections on treatment usually include an outline of well-known methods. Those who read German or who wish to have a work on therapeutics in German for practice in reading the language can use the volume with great satisfaction. G. D.

*Therapeutic Progress for 1906, edited by Doctor Arnold Pollatschek and Doctor Heinrich Nádor. Volume XVIII. Wiesbaden: J. F. Bergmann.

A PRACTITIONER'S HANDBOOK OF MATERIA MEDICA AND THERAPEUTICS.*

THIS work has been prepared for the purpose of broadening the view of the therapeutist. In it remedies, as recommended for use by the regular, the homeopathic, and the eclectic practitioner are described, and their respective featurs of excellence, as viewed by Doctor Blair, whether in their preparation or in their efficacy, are set forth. Doctor Blair is a practitioner of the so-called regular school of practice, and the conclusions he reaches are based on careful and long continued study. His special aim, as stated by himself, has been to unify pharmacy and, at the same time, to have the medical profession appreciate to a greater degree than is at present the case the satisfactory results that can be obtained from using drugs in small doses. Infinitesimal dosage is not considered.

It has long been the contention of the regular physician that any remedy capable of relieving suffering or disease should, in the natural order of things, find a place in his armamentarium. This being the case the present volume must be looked upon as aiding in the advance of general medicine. D. L. P.

*Based upon established physiologic actions and the indications in small doses. By Thomas S. Blair, M. D. Over 250 pages, bound in limp library cloth. Price, $2.00, net. Published by *The Medical Council,* 4105 Walnut Street, Philadelphia, Pennsylvania.

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ORIGINAL ARTICLES.

MEMOIRS.

THE MANAGEMENT OF SOME CASES OF INTESTINAL OBSTRUCTION.

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THE management of a case of intestinal obstruction may rest largely upon one point,—whether it is partial or complete. When the obstruction is partial, time may be taken for careful examination, and in some instances this will enable one to accurately determine the cause. Such cases may sometimes be relieved by nonoperative measures. On the other hand, complete obstruction may demand instant action, giving neither time nor opportunity to discover the origin of the trouble without exploration.

The cases which I have selected will fairly represent some of these types, and illustrate the method of determining and removing the cause; or, in cases where the obstruction is not removable, how to master the situation.

The first case, a man, fifty years old, was brought to the University hospital with complete obstruction, which had lasted four or five days. For several weeks there had been symptoms of partial obstruction. His abdomen was much distended and he had been vomiting. The pulse was rapid and feeble, and to all appearances he was seriously ill. The age and history of the patient suggested carcinoma of the intestines but furnished no guide as to the point where the disease might be located. The abdomen was opened, in the median line, and as the distended intestines rolled out, they were covered with warm towels. Two punctures were made in the transverse colon to relieve the distention, but with no result. Beginning at the lower part of the colon, which was collapsed, and examining upward, the obstruction was readily found. It proved to be an ulceration and constriction of the colon in the upper part of the sigmoid flexure.

Excision of the diseased portion of bowel was out of the question, because of the distention. A left inguinal colostomy was performed for the purpose of relieving the obstruction, and his condition was so much improved at the time of operation that the bowel was not opened until the next day. This permitted a large amount of gas and bowel contents to pass and relieve the obstruction. Two months later the abdomen was again opened, the diseased portion of bowel removed, and the ends united by suturing. The colostomy, which was allowed to remain while repair was taking place in the bowel section, closed gradually, so that at the end of three weeks only two skin sutures were necessary to close it. The patient remained well for a year, when the growth returned, causing obstruction. The loss of flesh, together with other evidence of metastasis, was sufficient reason for not attempting another abdominal operation, so the treatment consisted in reopening the colostomy. Death took place in a few weeks from the extension of the disease.

* * *

The second case, a married woman, was said to have had complete obstruction for twenty-one days previous to my visit. The abdomen was enormously distended. There was regular vomiting after taking food, but the patient did not appear very ill. All medical means for relieving the obstruction had been tried without avail. An incision was made in the median line, and, as in the preceding case, the obstruction was found in the sigmoid, but was not believed to be malignant. An inguinal colostomy was made and the bowel was immediately opened. This became necessary in order to put the intestines back into the abdominal cavity and close the median incision.

The patient bore the operation very well, although it was greatly prolonged by washing the intestines. Quarts of fecal matter were washed away before the obstruction was relieved. The patient made an excellent recovery. After some months the stricture of the bowel seemed to yield, and the feces resumed their normal channel. Another operation for the removal of the stricture was advised, but the friends would not consent. She died about two years later from a series of acute infections about the colostomy.

* * *

The third case, a man, sixty-five years old, was awakened at night by a severe pain in the epigastric region, followed by severe vomiting. As there were no previous signs of this trouble, a diagnosis of pyloric obstruction, acute gastritis or gall-stone colic might have been in order. I will pass over this part of the description, to forty-eight hours later, when the symptoms of obstruction were so marked that an operation was advised. The condition of the heart and blood-vessels was such that a general anesthetic should be avoided if possible. The symptoms led me to believe that the obstruction was somewhere near the ileocecal region, so, under local anesthesia, I opened the abdomen along the outer border of the right rectus muscle, examined the contents by passing my hand into the abdomen, but failed to find any collapsed bowel. There was a possibility that maniplation had removed a twist in the intestines, or that an internal obstruction had in some way been relieved during the examination. Not satisfied that complete relief was certain, I attached the caput to the abdominal wall and opened it, thus allowing gas and feces to escape at once.

He seemed improved for a time, but hiccough, which began the day before the operation, and still continued at intervals, was fast wearing him out. It was evident that the trouble was not entirely removed. Two days after the first operation the abdomen was opened in the median line, under local anesthesia. Handling of the bowels seemed to produce so much pain that a little ether was given. The small intestine was carefully examined, and a round movable mass was found about three feet from the cecum. An incision about three inches long was made over the mass on the side opposite the mesentary and a large gall-stone was removed.

Here we have an example of obstruction in the small intestine, not always partial, not always complete, but sufficient to cause dangerous symtoms. The hiccough persisted, the pulse became very weak, and on the following day he died. A postmortem examination showed that death was due to infection from an abscess in the gall-bladder and surrounding structures. A mistake was probably made in this case in not making my first operation complete, that is, a median section, taking out the intestines and examining them carefully until the obstruction was found.

* * *

The fourth case, a boy of nineteen, had two previous attacks of partial obstruction, so slight that they were not recognized as such, but the third was so complete that it left no doubt as to the diagnosis. Two or three years before, he had received an injury to the back, over the left kidney; this was one clue to the location of the obstruction. Pain in this locality, and the impossibility of passing the rectal tube beyond this point, were corroborative symptoms. The distention was so great that very little could be determined from the outside.

A median incision was made large enough to admit the hand. The sigmoid part of the colon was found collapsed, and, following it upward, the obstruction was located in the transverse colon. It was a growth completely closing the lumen of the bowel and binding it to the posterior wall, just over the left kidney. The patient was very weak from the effects of obstruction, which had lasted more than a week, and as the bowels were so enormously distended that there was no room for work, a right colostomy was done, and the bowel opened at once. Obstruction had existed so long that the intestines seemed paralyzed and did not collapse, thus making it difficult to return them to the cavity and close the median incision.

The patient made a good recovery, improved in flesh, and about two months later I made another attempt to get rid of the obstruction. An incision was made to the left of the median line long enough to admit the hand. The mass found at the previous operation seemed to have increased in size with enlargement of the abdominal lymph nodes in the neighborhood. The age of the patient and the conditions suggested tuberculosis. Removal of the diseased part was out of the question. I made an anastomosis between the transverse and sigmoid portions of the colon by incision and suture. Again the patient made a good recovery and did well for several weeks, when obstruction again returned, this time probably because of extension of the disease, or contraction of the anastomotic opening. I was called again to give him relief, but found that the best thing I could do was to open the colostomy, which was done. The scars formed in the operation wounds presented such a peculiar appearance that I secured a section from the colostomy scar and sent it to the pathologist, who reported carcinoma.

No further operation was attempted upon this patient, and he died some weeks later of extension of the disease and starvation.

* * *

The fifth case is one of a number in which the obstruction can be removed at the time of operation: a woman, thirty years old, who had never shown any symptoms of obstruction until the present attack. This attack began with vomiting and pain in the region of the appendix. Within twenty-four hours of the onset, the obstruction was so marked that there could be no doubt about the advisability of operation. The median incision was made, and a portion of the small intestine was found collapsed. A band of adhesions was found above this, extending from the mesentery over a loop of bowel, attached to the bowel and also to the mesentery beyond. The band was removed, the broken peritoneum over the bowel was sutured, and the abdomen closed. The patient made an uneventful recovery.

I might mention numerous cases, but these will suffice for a few types. My first case, the old man, fairly represents a slowly forming obstruction in the large bowel. There will be little pain after the first onset. The distention may be enormous, and it is surprising how long these patients may live without relief. The location of the obstruction may sometimes be found by rectal examination, but in most cases it will be necessary to open the abdomen. A median incision will usually have to be made to determine the point of obstruction, and the best means for relieving it.

Distention usually interferes with the removal of the obstruction, or the forming of an anastomosis around it. There is no reason why the bowel may not be immediately opened, after forming a colostomy, if the condition of the patient demands it.

Obstruction in the small bowel is far more rapidly fatal than obstruction of the large bowel. The first thing to do in the way of treatment is to wash the stomach. This not only relieves the patient but prepares for operation. Care must be exercised not to lose too much time in the employment of medical measures for relief. It is well known that the contents of the small intestines may in some cases be highly poisonous, and quickly lead to fatal result. This fact is usually announced by early distention of the stomach and the intestine above the point of obstruction, together with a rapid pulse.

Simple puncture of the intestine does not help to relieve the distention to any great extent. If necessary, any portion of the bowel can be brought through an incision in the abdominal wall, and opened. If necessary a tube may be inserted, through which the bowel can be rapidly washed and the distention relieved.

Thrombosis, or gangrene, by twisting or pinching by a band of adhesions, may require exposure and immediate resection of a long loop of bowel.

Obstruction rarely becomes immediately fatal unless operation is too long delayed.

Ann Arbor, 109 Main Street, South.

A COMPARATIVE STUDY OF THE OCCULT BLOOD TESTS; A NEW MODIFICATION OF THE GUAIAC REACTION; ITS VALUE IN LEGAL MEDICINE.*

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[FROM THE CLINICAL LABORATORY OF INTERNAL MEDICINE, UNIVERSITY OF MICHIGAN.].

OCCULT blood reactions, chemical reactions for the recognition of minimal hemorrhages into the gastrointestinal tract unrecognizable by the unaided eye, have been the subject of considerable discussion among internists during the past two or three years. It is only within a very short time that much stress has been laid upon the value in the differential diagnosis of gastrointestinal diseases of the recognition of these minimal hemorrhages. Our present knowledge of the subject may be said to date from the appearance of Boas' first article.[1] So little attention was given to this that in his second article, which appeared a year later, he expresses surprise that clinicians have neglected what he considers a great advance in our clinical knowledge of these diseases. Practically two years passed before the work was seriously taken up by

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*The first appearance of the complete article bearing this title. In abridged form the author has already contributed most of the subject matter to the *American Journal of the Medical Sciences,* March, 1907. In this issue the experiments are given in detail.

[1] Sammlung klin. Vorträge, February, 1905, Number CCCLXXXVII. (Many other references.)

others, and then followed contributions from, Schmilinsky,[2] Joachim, Schloss,[3] Hartmann,[4] Clemm,[5] and a few others, all of whom reassure us of the value of these tests. The history of the original Weber[6] reaction has been one of repeated modifications and a changing of the conception of what is and what is not a proper end reaction.

The tests fortunately are very simple, but experience has taught us that this simplicity must be conducted with decided care, particularly in experimental work. Weber's test and all of its modifications depend upon three definite principles: (1) That changed hemoglobin is soluble in acetic acid, forming acid hematin; (2) that acetic acid solutions of hematin are soluble in sulphuric ether; and (3) that guaiac resin when dissolved and ozonized in a solution of blood causes a typical color reaction. I give herewith the original Weber test and its most important modifications, as well as the Klunge aloin test. For convenience the successive steps in each test have been numbered.

WEBER'S TEST.

(1) Five cubic centimeters of stomach contents or a similar amount of softened stool is mixed with one-third its amount of glacial acetic acid.

(2) To the above mixture add an excess of ether and allow to extract.

(3) To a portion of the resulting extract add ten drops of a freshly prepared tincture of guaiac, and shake thoroughly.

(4) Add thirty drops of old turpentine.

If the reaction is positive an intense blue color results. If there is much blood present the ether extract becomes a Tokay color. If there is little blood the ether remains uncolored.

BOAS' FIRST MODIFICATION OF THE WEBER TEST.

(1) About five cubic centimeters of soft stool is extracted with twenty cubic centimeters of ether to remove the fats.

(2) Pour off the resulting extract.

(3) Add two or three cubic centimeters of glacial acetic acid to the remaining stool, and mix thoroughly.

(4) Extract with ten cubic centimeters of ether.

(5) Add a few granules of powdered guaiac resin to a portion of the above extract in a test-tube and shake carefully.

(6) Add thirty drops of old turpentine.

The main difference is that Boas first extracts with ether to remove the fats that may be present and employs the powdered guaiac in place of the tincture.

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[2] *Münchener medizinische Wochenschrift,* 1903, Number XLIX.

[3] *Archiv für Verdauungskrankheiten,* Band X, Heft 3.

[4] Ibidem, Band X, Heft 1.

[5] Ibidem, Band X, Heft 4.

[6] *Berliner klinische Wochenschrift,* 1893, Number XIX.

BOAS' SECOND MODIFICATION OF THE WEBER TEST.

Instead of using old turpentine Boas later recommended the use of dilute hydrogen peroxid—a three to five per cent solution. He was then of the opinion that it was not necessary first to remove the fats, and this part of the test was dispensed with. Boas found this method more delicate than the turpentine method.

Rossel advises that when the test is applied to the stomach fluid it should first be neutralized. Boas claims that neutralization is not necessary. This is very easy to demonstrate.

AUTHOR'S WATER MODIFICATION.

(1) All glassware must be chemically clean and perfectly dry.[7]

(2) To one gram of stool which has been softened if necessary by as few drops of water as possible, about four or five cubic centimeters of glacial acetic acid is added and intimately mixed. This is best accomplished by rubbing up in a glass mortar.

(3) To the above mixture add thirty cubic centimeters of ether and allow to extract for several minutes, after thoroughly shaking or mixing. Good results are generally obtained with fifteen cubic centimeters of ether.

(4) To one or two cubic centimeters of the extract, which is perfectly clear and can be decanted off, add an equal amount of distilled water and shake thoroughly.

(5) To the resulting mixture add a few granules of powdered guaiac resin, an amount that will be held on the tip of a small knife-blade; this is allowed to dissolve and the tube is agitated thoroughly.

(6) Thirty drops of old water-white chemically pure turpentine is now added, and thoroughly mixed with the contents of the tube. Set aside against the light or in front of a white surface.

If blood is present to the amount of one milligram to one gram of stool a distinct light-blue color develops quickly in the upper half of the mixture, remains for a short time, and gradually disappears. Larger amounts of blood cause a more intense blue, but almost always a turbid, or opaque blue, often the color of a turquoise.

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[7] The precaution of absolute dryness is not necessary if comparatively large amounts of blood are present. My assistant, Dr. Lily T. Roche, obtained a positive blue in the early morning several times by the author's method. Other methods were negative. I was unable to verify the results at 11 A. M., neither could Doctor Roche. We then sought for an explanation. Fearing that the early morning positive reaction was due to contamination of the tubes they were all washed with nitrohydrochloric acid and thoroughly rinsed in distilled water. No reaction occurred in these tubes. An old tube that had not been used and which did not look clean was now used and a beautiful blue reaction occurred. New tubes that had not been unwrapped also permitted the reaction to take place. We repeated this experiment many times, always obtaining a reaction in a perfectly dry tube, never obtaining it in a damp tube. The other modifications did not take place in the dry tubes. From this time on a set of tubes was kept thoroughly dry by draining over night and heating in the oven if necessary. The reason for the reaction occurring in the early morning was due to the fact that the tubes had dried over night.

If the reaction is intense it may be better seen if about ten cubic centimeters of ether is added to the original extract. If smaller amounts of blood are present the reaction may assume a smoky grass-green color. (See later.) The reaction may be sometimes intensified by extracting the greater part of the coloring matter with alcohol, which may be filtered off. This makes the test long and it is seldom necessary.

Several other modifications might be mentioned, but on careful perusal they will be found to be unintentional modifications, due to a misconception of the successive steps of the original reaction; when applied to very minute amounts of blood they do not react. As the re-extraction with ether has been shown by Boas and others, and can be easily demonstrated, to be of no importance, it is omitted in the experiments that follow; the difference between the two tests being simply in the oxidizing agent employed. Other variations that have been made are noted.

ALOIN TEST.

Klunge has introduced what is known as the aloin test, the successive steps of which are as follows, the principle of the reaction being the same as the guaiac reaction:

To the acetic acid and ether extract obtained as above, twenty to thirty drops of ozonized turpentine is added. The resulting mixture is now treated with from ten to fifteen drops of a freshly prepared tincture of aloin. (About three grains to five cubic centimeters of seventy per cent alcohol.) If blood is present, a beautiful cherry-red color gradually develops, but sometimes requires many minutes. By adding a few drops of chloroform the color change may be hastened and intensified. The cherry-red color usually develops in the bottom layer, which is the aloin layer. At other times the entire contents of the tube are changed to a pink or light cherry color. A contact test results if the aloin solution is allowed to run down the side of the tube. A slight pink color will often develop in an hour's time in the absence of blood. The reaction should occur within one-half hour to be positive. Boas employs this test as confirmatory of the guaiac test. He thinks that at times it is more sensitive than the guaiac test.

EXPERIMENTS.

SERIES I.—MEAT DIET.

(SEE TABLE I.)

It has been claimed that reactions for occult blood occur in the stools of individuals eating a meat diet, and that for this reason the test should be applied only when the patient is eating a meat-free diet. The purpose of this experiment is, therefore, to inquire into the frequency with which the reactions do occur with the ordinary meal. To this end patients were selected without any reference to their ailment; they were eating the regular hospital diet, which consists of meat at least twice and often three times daily. In an institution where hundreds are being fed the meat is not always thoroughly cooked, that is, rare meat is commonly seen. The conditions, accordingly, are well adapted for this experiment.

In all, the stools of thirty-four patients were examined. The consistency varied from partly formed to those containing hard and dry cylinders. In only two cases were positive results obtained (Cases II and XX). Inquiry disclosed the fact that Case II had had a visible hemorrhage the previous day, and Case XX, in whom there had been no suspicion of hemorrhage, was found on subsequent examination to have postnasal conditions which caused a more or less constant oozing into the digestive tract.

Both the guaiac and the aloin tests were made in each case. The experiment illustrates that the tests are not delicate enough to recognize the small amounts of blood that are swallowed with the uncooked portions of the meat. It can be said that individuals on an ordinary meat diet seldom if ever give a reaction for occult blood, and that if a reaction occurs it is in all probability due to some pathological process in connection with the gastrointestinal canal. In this series the ether extract was very little influenced by the color of the stool.

Since the above tests were made we have examined a large number of stools of patients under the same conditions, and have yet to find a positive reaction due to uncooked meat.

SERIES II.—MEAT INGESTION.

(SEE TABLE II.)

The following experiments were made in order to gain some idea of the amount of uncooked red meat that must be ingested before a reaction for occult blood can be obtained in the stools, and also to determine the length of time after the ingestion of the meat before the reaction appears and disappears. The meat was prepared by scraping round steak and chopping it into a very small amount of onion, pepper, and salt. No fiber was present. The amounts were weighed on the ordinary laboratory balance, and are of course only approximate, yet are fairly accurate. The method that has been found the most delicate is the one that is recorded.

EXPERIMENT I.—Mrs. G. Fifty grams of scraped beef was given at 11 A. M. First stool passed in twenty-one hours; water, guaiac, turpentine method was positive; Klunge test was negative. Second stool was not saved.

EXPERIMENT II.—Fifty grams of scraped beef was given at 11 A. M. First stool passed in twenty hours; water, guaiac, turpentine method was positive; Klunge aloin test was negative. Second stool passed in forty-two hours; water, guaiac, turpentine method was negative;

Klunge aloin test was negative. Third stool passed in seventy-two hours; water, guaiac, turpentine method was negative; Klunge test was negative.

Experiment III.—Forty grams of scraped beef was given at 11 A. M. First stool passed in twenty-one and one-half hours; water, guaiac, turpentine method was positive; Klunge test was negative. Second stool passed in forty hours; water, guaiac, turpentine method, and Klunge test were negative. Third stool passed in seventy hours; all tests were negative.

Experiment IV.—Mrs. E. Thirty grams of scraped beef was given at 11 A. M. First stool passed in twenty-one hours; water, guaiac, turpentine method was positive; Klunge aloin test was negative. Second stool passed in seventy hours; water, guaiac, turpentine method, and Klunge test were negative.

Experiment V.—Mr. E. Twenty grams of scraped beef was given at 11 A. M. First stool passed in ten hours; water, guaiac, turpentine method was positive;[8] Klunge aloin test was negative.

Experiment VI.—Mr. D. Fifteen grams of scraped beef was given at 11 A. M. First stool passed in twenty hours; water, guaiac, turpentine method was questionable; Klunge aloin test was negative.

Experiment VII.—Mrs. G. Ten grams of scraped beef was given at 11 A. M. First stool passed in nine and one-half hours; water, guaiac, turpentine method was negative; Klunge aloin test was negative. Second stool passed in twenty-four hours; water, guaiac, turpentine method, and Klunge test were negative.

Experiment VIII.—Mr. H. Stomach was thoroughly washed and drained. At 11 A. M. ten grams of chopped beef was given. The first stool was passed in eighteen hours—hard, brownish-green cylinders one inch in diameter, with no visible blood; extract, water, guaiac, turpentine method, change to blue-green which faded; extract, guaiac, turpentine method was negative; extract, guaiac, dilute hydrogen peroxid method, black reaction in upper layer; extract, guaiac, strong hydrogen peroxid method, black reaction in upper layer; Klunge test gave a positive red in the bottom of the tube in a very few minutes.

Experiment IX.—Miss S. Ten grams of chopped beef was given. The first stool was passed in twenty-nine hours—yellowish-brown, semisolid. Extract, water, guaiac, turpentine method quick change to light green deepening to grass-green with no blue; extract, guaiac, turpentine method, no reaction; extract, guaiac, dilute hydrogen peroxid method, a brownish reaction in upper layer; extract, guaiac, strong hydrogen peroxid method, a black reaction in the upper layer; Klunge test gave a reddish-brown reaction intensified by chloroform.

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[8] A grass-green color quickly appears, this intensifies to a deep green, and very gradually fades away.

Second stool passed on the following day; extract, water, guaiac, turpentine method, quick change to light green which gradually deepened and faded with no blue; extract, guaiac, dilute hydrogen peroxid method, no change; extract, guaiac, strong hydrogen peroxid method, plum-color reaction which did not fade in two hours; extract, guaiac, turpentine method, no change; Klunge test was absolutely negative after half an hour.

EXPERIMENT X.—Mrs. J. Stomach was washed and thoroughly drained. Ten grams of chopped beef was given at 11:45 A. M. First stool was passed in eighteen hours—yellowish-brown dry cylinders; all tests were negative. Second stool was not saved.

CONCLUSIONS.

(1) In order that a positive reaction for occult blood be obtained after eating uncooked meat there must have been ingested ten grams of beef. The smallest amount to give a distinct blue reaction with the guaiac tests was twenty grams. Of five tests below twenty grams the reaction was positive twice, negative three times.

(2) The reaction if positive always occurs in the first stool passed after eating the test meal. This occurred in one case as early as ten hours, in another as late as twenty-nine hours. Only once did it occur with the second stool and never with the third stool.

(3) The water modification of the guaiac test gives the most uniform results. Both hydrogen peroxid methods and Klunge's test were at times as sensitive as the water modification. The Boas reaction with turpentine is far less sensitive than any of the others. I have been unable after many trials to obtain a reaction with less than ten grams of beef. Weber reports positive results with three grams of meat.

SERIES III.—BLOOD AND STOOL MIXTURE.

(SEE TABLES III TO VII.)

The purpose of this series of experiments was to determine the sensitiveness of the guaiac and the aloin tests. A definite amount of blood was added to a definite amount of stool. The quantity in each was determined by exact weight. The first three experiments were conducted by calibrating a capillary tube so that the weight of each drop would correspond. Fearing that this was not as accurate as it should be the remaining tests were made by determining exactly the weight of the blood on a very delicate balance with agate bearings and the exclusion of currents of air. The blood in each experiment was always taken from the same person. It was found that in the cases in which the calibrated tube was employed a drop of blood from one person differed in weight from that of another person, but corresponded quite closely with another drop from the same person. For this reason more than one experiment was necessary in order that definite conclusions could be reached.

Experiment I.—Drop method. 0.005 gram of blood was added to one gram of feces; guaiac, turpentine method was negative; Klunge aloin test was negative. 0.010 gram of blood was added to one gram of feces; guaiac, turpentine method was negative; Klunge aloin test was negative. 0.015 gram of blood was added to one gram of feces; guaiac, turpentine method was negative; Klunge aloin test was negative. 0.020 gram of blood was added to one gram of feces; guaiac, turpentine method gave a distinct greenish color; Klunge aloin test gave a distinct but light cherry color. 0.025 gram of blood was added to one gram of stool; guaiac, turpentine method gave a distinct blue color; Klunge aloin test gave a distinct but light cherry color.

Experiment II.—Drop method. 0.005 gram of blood was added to one gram of feces; guaiac, turpentine method gave a light greenish tinge; Klunge aloin test gave a questionable pinkiness. 0.010 gram of blood was added to one gram of feces; guaiac, turpentine method gave a light greenish color; Klunge aloin test gave a very slight pinkiness. 0.015 gram of blood was added to one gram of feces; guaiac, turpentine method gave a questionable color change; Klunge aloin test was questionable. 0.020 gram of blood was added to one gram of feces; guaiac, turpentine method gave a positive blue color; Klunge aloin test gave a positive cherry. 0.025 gram of blood was added to one gram of feces; guaiac, turpentine method gave a positive blue to purple; Klunge aloin test gave a very positive cherry.

Experiment III.—Drop method. 0.005 gram of blood was added to one gram of feces; guaiac, turpentine method was negative; Klunge aloin test was negative. 0.010 gram of blood was added to one gram of feces; guaiac, turpentine method was negative; Klunge aloin test was negative. 0.015 gram of blood was added to one gram of feces; guaiac, turpentine method gave a greenish tinge, positive; aloin test was questionably negative. 0.020 gram of blood was added to one gram of feces; guaiac, turpentine method, which gave a distinct pale green, was positive; Klunge aloin test was questionably negative. 0.025 gram of blood was added to one gram of feces; guaiac, turpentine method, distinct blue to purple, was positive; Klunge aloin test, distinct but light cherry, was positive.

Experiment IV.—Exact weight method. 0.002 gram of blood was added to one gram of feces; guaiac, turpentine method; no change in color, was negative; Klunge aloin test, no change in color, was negative. 0.003 gram of blood was added to one gram of feces; guaiac, turpentine method, no change in color, was negative; Klunge aloin test, no change in color, was negative. 0.004 gram of blood was added to one gram of feces; guaiac, turpentine method, light greenish tinge, which faded, was positive; Klunge aloin test, upper portion of tube opalescent, was questionable. 0.005 gram of blood was added to one gram of feces; guaiac, turpentine method, light greenish tinge, which faded, was positive; Klunge aloin test, upper portion of tube pinkish, was questionable. 0.006 gram of blood was added to one gram of feces; guaiac, turpentine method, distinct light green, which faded, was positive; Klunge aloin test was questionable. 0.007 gram of blood was added to one gram of feces; guaiac, turpentine method, distinctly deeper green, which faded, was positive; Klunge aloin test, same as before, was questionable. 0.008 gram of blood was added to one gram of feces; guaiac, turpentine method, suggestion of blue, was positive; Klunge aloin test, same as before, was questionable. 0.009 gram of blood was added to one gram of feces; guaiac, turpentine method, pale smoky blue, which faded, was positive; Klunge aloin test was questionable. 0.010 gram of blood was added to one gram of feces; guaiac, turpentine method, pale blue, which faded, was positive; Klunge aloin test, same as before, was questionable. 0.015 gram of blood was added to one gram of feces; guaiac, turpentine method, deep purple-blue, which faded, was positive; Klunge aloin test, same as before, was questionable.

EXPERIMENT V.—Exact weight method. 0.002 gram of blood was added to one gram of feces; guaiac, turpentine method, no change in color, was negative; Klunge aloin test, no change in color, was negative. 0.005 gram of blood was added to one gram of feces; guaiac, turpentine method, light greenish color, which faded, was positive; Klunge aloin test, no change in color, was negative. 0.010 gram of blood was added to one gram of feces; guaiac, turpentine method, positive green to blue, which faded, was positive; Klunge aloin test, no change in color, was negative. 0.015 gram of blood was added to one gram of feces; guaiac, turpentine method, deep purple blue, which faded slowly, was positive; Klunge aloin test, questionable pinkiness, was questionable.

EXPERIMENT VI.—Exact weight method. 0.004 gram of blood was added to one gram of feces; guaiac turpentine method, quick change to light green which gradually changed to smoky blue, was positive; guaiac, dilute hydrogen peroxid method, quick change to light green, which very quickly faded without a suggestion of blue, was positive; water, guaiac, turpentine method, which gave a beautiful light blue, appeared and gradually faded, was positive; Klunge aloin test, no change in color, was negative. 0.003 gram of blood was added to one gram of feces; guaiac, turpentine method, absolutely no change in color, was negative; guaiac, dilute hydrogen peroxid method, very quick change to grass-green, no suggestion of blue, was positive; water, guaiac, turpentine method, immediate change to greenish-blue which gradually changed to a pale blue having a green quality, was positive; Klunge aloin test, no change in color, was negative. 0.002 gram of blood added to one gram of feces; guaiac, turpentine method was absolutely negative; guaiac, dilute hydrogen peroxid method, no change in color, was negative; water, guaiac, turpentine method, which gave a distinct, quickly appearing flat green with a suggestion of blue, which faded, was positive; Klunge aloin test gave no change, was negative. 0.001 gram of blood added to one gram of feces; guaiac, turpentine method, which gave a very delicate green color which faded, was positive; guaiac, dilute hydrogen peroxid method, gave no change in color, was negative; water, turpentine, guaiac method, which gave a beautiful sky blue which faded, was positive; Klunge aloin test, which gave no change in color, was negative. 0.005 gram of blood added to one gram of feces; guaiac, turpentine method, which gave no change, was negative; guaiac, dilute hydrogen peroxid method, which gave no change, was negative; water, guaiac, turpentine method, which gave a very faint tinge of green but no blue, faded, was positive.

This patient's stools had been tested for several days previous to the experiment, as a control. They had always given a negative reaction with all tests. The stool with which this experiment was made was soft, formed, and of a light-yellow color.

EXPERIMENT VII.—Exact weight method. 0.004 gram of blood was added to one gram of feces; guaiac, turpentine method, light green changing to smoky blue, was positive; guaiac, dilute hydrogen peroxid, pale green appeared quickly and soon disappeared, with no blue, was positive; water, guaiac, turpentine method, which gave a beautiful blue, which faded, was positive; Klunge aloin test, which gave no change, was negative. 0.003 gram of blood was added to one gram of feces; guaiac, turpentine method, which gave no change of color after repeated tests, was negative; guaiac, dilute hydrogen peroxid, which gave a very quick change to a distinct grass-green, with no blue, was positive; water, guaiac, turpentine method, which gave an immediate change to greenish-blue, gradually developing a pale-blue color which faded, was positive; Klunge aloin test, which gave no change in color, was negative. 0.002 gram of blood was added to one gram of feces; guaiac, turpentine method, which gave no change, was negative; guaiac, hydrogen peroxid method, which gave no change, was negative; water, guaiac, turpentine method, which gave a distinct and quickly appearing cloudy green with a suggestion of blue which faded, was positive; Klunge aloin test, no change, was negative. 0.001 gram of blood was added to one gram of feces; guaiac, turpentine method, which gave no change of color, was negative; guaiac, dilute hydrogen peroxid method, which gave no change, was negative; water, guaiac, turpentine method, which gave a beautiful sky blue, which gradually appeared and disappeared, was positive; Klunge aloin test was negative. 0.0005 gram of blood was added to one gram of feces; guaiac, turpentine method, was negative; guaiac, dilute hydrogen peroxid method, was negative; water, guaiac, turpentine method, which gave a beautiful delicate sky blue color, which faded, was positive; Klunge aloin test was negative.

The stool with which all these tests were made was of a light-yellow color and thoroughly soft throughout. It was a semiformed stool and the blood could be triturated into it in a most thorough manner.

Experiment VIII.—0.0004 gram of blood, by exact weight, was added to one gram of stool and very thoroughly mixed; turpentine, guaiac method (Boas) was absolutely negative; guaiac and dilute hydrogen peroxid method (Boas) was negative; author's water, guaiac, and turpentine method showed a distinct blue ring on the top of the liquid; Klunge aloin reaction was absolutely negative; control was negative.

Experiment IX.—0.00035 gram of blood, by exact weight, was added to one gram of feces, and thoroughly mixed; guaiac, turpentine method (Boas) was negative; guaiac, dilute hydrogen peroxid method (Boas) was negative; guaiac, undilute hydrogen peroxid was negative; author's water, guaiac, and turpentine method showed a faint but distinct greenish color in the top of the liquid which quickly appeared and gradually disappeared; Klunge test was negative; control was negative. Below this dilution the water method failed.

CONCLUSIONS.

From the foregoing experiments the following deductions can be made:

(1) The guaiac reaction in all of its modifications is constantly markedly more sensitive than the Klunge aloin reaction. There are times when the aloin reaction seems as sensitive as the guaiac (Experiment I), but the drop method is not trustworthy.

(2) The limit of sensitiveness of the original Boas turpentine method is 0.004 gram of blood per gram of feces. Under certain circumstances it may recognize 0.001 gram of blood per gram of stool (Experiment VI).

(3) The limit of sensitiveness of the Boas test when dilute hydrogen peroxid is used is 0.003 gram of blood per gram of stool.

(4) The limit of sensitiveness of the author's water and turpentine modification is 0.00035 gram of blood per gram of feces.

(5) A color that appears and gradually fades is the crucial test of a positive guaiac reaction.

(6) The limit of sensitiveness of the Klunge aloin test is 0.02 gram of blood in one gram of feces. Under certain conditions, as in Experiments IV and V, a questionable or very faint reaction occurs with 0.015 and 0.004 gram respectively.

(7) Most authors agree that it is necessary to obtain a distinct blue color before the reaction can be called positive. Schmilinski,[9]

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[9] *Münchener medizinische Wochenschrift*, 1903, Number XLIX.

however, is not of this opinion. He regards all shades that develop from a deep green to a reddish brown changing into a violet in which the red is more prominent, and finally the blue predominates as positive as the blue itself. My experience enables me to confirm Schmilinski's contention, as well as to carry it a step farther, and say that all colors that result, from a light distinct tinge of green to green, green to deep green in which at times, but seldom, there is a reddish quality, light violet to blue, or deep blue to indigo blue, are positive evidence that blood is present.

(8) The color index may be used as an approximate means of estimating the extent of the hemorrhage. In this series of experiments there was never a change in color with the control, nor was there ever a change in color in the many stools we have examined in the laboratory and marked negative. There was no change, whatsoever, in any experiment until at least 0.00035 gram of blood was added to one gram of feces. The first change that was observed was always a light green which became intensified and changed to blue proportionately as the amount of blood per gram was increased. (In one case which showed occult hemorrhages with marked reaction, as the condition subsided the reaction became fainter and fainter until a light green was also all that could be obtained, and this eventually disappeared. This is another evidence that the green color is positive of blood.) It may be said that if from a light green to a distinct green color develops, a hemorrhage sufficient to mix intimately 0.0005 gram of blood with every gram of feces has occurred; that if a strong reaction is obtained 0.001 gram of blood is present in each gram of feces. As has been shown by the experiments with ingested blood, such a hemorrhage must have amounted to at least 0.5 to one gram, provided it took place in the stomach or jejunum or at some point above these parts.

SERIES IV.—BLOOD INGESTION.

The purpose of this series of experiments was: (1) To determine the amount of human blood that must enter the intestine from the mouth or stomach before a reaction for occult blood will be obtained in the feces. (2) To determine the time that elapses after the ingestion before the reaction is positive. (3) To determine the time that elapses after the appearance of the reaction until it disappears. (4) To determine the comparative sensitiveness of the modifications of the guaiac test and of the aloin test.

To this end blood was taken from the finger of a perfectly healthy person, always from the same person, carefully weighed on a common laboratory balance which weighs quite accurately to tenths of a gram, and quickly mixed with a whisky-glassful of water. The patient was given the contents of the glass to drink, after which it was rinsed and the rinse water swallowed. The stools of these patients were controlled for several days previous to the experiment and were found to be negative. After the ingestion of the blood all bowel movements were saved and the time of their occurrence marked. Sometimes several hours passed before the test was made. It was found, however, that in stools showing reactions for very minute amounts of blood the reaction was not less positive by ageing them for twenty-four hours or more. The results are as follows:

EXPERIMENT I.—Mr. D. Two grams of blood was given at 11:45 A. M. First stool passed in fifteen and three-quarter hours—constipated; guaiac, turpentine method (Boas) was negative; guaiac, dilute hydrogen peroxid, negative; guaiac, undilute hydrogen peroxid, negative; author's water, guaiac, and turpentine method, gave a beautiful blue color. Second stool passed in forty-eight hours; guaiac, turpentine method (Boas) was negative; all other modifications and Klunge aloin test were negative.

EXPERIMENT II.—Mrs. E. One gram of blood was given at 11:30 A. M. First stool passed in twenty-one hours—constipated; guaiac, turpentine method (Boas) was negative; all other modifications and Klunge aloin test were negative. Second stool passed in forty-six hours; all tests were negative. Third stool was passed in seventy-three hours; all tests were negative.

EXPERIMENT III.—Mr. A. One gram of blood. First stool passed in eighteen hours—was formed; author's water method and dilute hydrogen peroxid method were positive; all other methods were negative. Second stool was passed some hours later, time record lost; all methods were negative.

EXPERIMENT IV.—Mrs. C. 0.5 gram of blood was given at 11:30 A. M. First stool passed in eighteen and one-half hours—slightly constipated; water, guaiac, turpentine method gave a delicate green color, developed slowly, gradually changed to a distinct grass green, and slowly disappeared, was positive; all other methods, though repeated several times, showed no change of color whatsoever.

EXPERIMENT V.—Mrs. B. 0.5 gram of blood was given at 11:40 A. M. First stool was passed in seventeen and three-quarter hours—hard; guaiac, water, turpentine method gave a pale-green color, but not a typical reaction; all other methods gave no change of color. Second stool was passed in thirty-nine hours; all methods negative.

EXPERIMENT VI.—Miss S. 0.5 gram of blood was given at 11:20 A. M.. First stool was passed in four and one-quarter hours—mushy; all methods were absolutely negative. Second stool was passed in eighteen and one-half hours—soft; all methods were negative.

EXPERIMENT VII.—Miss B. 0.5 gram (fine balance) of blood was given at 3 P. M. First stool was passed in thirteen hours—dark brown and formed; all methods were negative. Second stool was also negative to all tests.

Experiment VIII.—Mr. S. 0.5 gram of blood (fine balance) given at 9:25 A. M. First stool was passed in twenty-one hours—brown, and mushy; all methods were negative. The second stool was also negative.

CONCLUSIONS.

(1) In order that a positive reaction for occult blood occur in the stools after a hemorrhage from the esophagus or the stomach, the hemorrhage must amount to 0.5 gram. With such a hemorrhage only a very faint reaction is present. With a gram of blood a decided reaction is always present.

(2) The reaction always occurred in the first stool passed after the blood ingestion. The earliest reaction was obtained fifteen and three-quarter hours after ingestion.

(3) The reaction was never present in the second stool passed after ingestion.

(4) In this series the water, guaiac, turpentine method was much more sensitive than any of the other modifications. Next in point of sensitiveness was the guaiac and dilute hydrogen peroxid method. The aloin reaction did not take place in any case.

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The foregoing study illustrates the peculiar diversity of results that may be obtained with the different occult blood tests, and at times by the same test, when very minute amounts of blood are dealt with. This not only holds true with feces and blood mixtures but also with stools after the ingestion of blood. In the former case it seems as if the character of the stool has something to do with the sensitiveness of the reaction. A stool with a comparatively large water content, that is, a soft, mushy stool, permits of the recognition of smaller amounts of blood than does a pasty or dry stool. Yet there is a limit to the amount of water that may be added to a pasty stool. In the cases of blood ingestion, it was thought that possibly variations in the sensitiveness of the reaction in different individuals was due to variations in their respective digestive power or to variations in the rapidity with which the food is propelled along the gastrointestinal canal. Thus it was thought that in cases of achlorhydria possibly occult blood would be detected in smaller amounts than in cases of hyperchlorhydria, and that in cases of hypermotility it would be recognized in smaller amounts than in cases showing normal motility or stasis. I soon found that there was nothing in this view, and that after digesting small amounts of blood in test-tubes with stomach fluids of strong digestive power the test was as positive in these tubes as in the control. If, on the other hand, the blood was diluted with water, boiled, and then added to the gastric fluid no occult blood test occurred. The action of the digestive juices has practically nothing to do with the hindrance of the occurrence of the reaction, as has been claimed. The reason for the occurrence of occult blood in cases of achlorhydria is because in this condition erosion is very frequently present.

The character of the stool seemed to have little relation to the sensitiveness of the reaction in the ingestion experiments, as it occurred as readily in a hard dry stool as in a soft one. But these peculiarities are doubtless responsible for the diversity of results obtained by various experimenters. Weber found that after three grams of uncooked beef a reaction occurred. I have been unable to verify this contention after many trials, not only with Weber's test, but with other modifications which have always proved more sensitive. Joachim found that three grams of ingested blood gave the reaction. With the water modification I was able to get a distinct reaction with 0.5 gram of ingested blood, but was also unable to obtain it with any other test. Schloss obtained a positive reaction when he added 0.0008 to 0.0006 gram of blood to a given amount of stool. Kochmann and Boas obtained a reaction with 0.0008 gram, while Hartmann obtained it with 0.0001 gram. Schloss is inclined to disbelieve Hartmann's contention, and I am unable to demonstrate a reaction with these amounts after many trials. From the diversity of results I have obtained in other experiments, being able to detect with the Boas and Weber tests even smaller amounts of blood than many of these observers have, and still smaller amounts at times with the water modification, I am inclined to believe that the results of all these men are correct, and that it is possible to detect the minute amount reported by Schloss, if the proper conditions present themselves. In the majority of instances the Boas test with turpentine is made much more sensitive by the addition of water before adding the guaiac resin.

THE RECOGNITION OF MINUTE BLOOD-STAINS ON CLOTHING.

For the recognition of small fresh or dried blood-stains on clothing or other fabrics, I have found the following method to be very sensitive. The test so frequently referred to in works on legal medicine, and often described as Taylor's guaiac method, has not proved as sensitive.

(1) Cut out the stain with a pair of scissors.

(2) Add from two to ten drops of water according to the size of the stain and rub thoroughly with a glass rod.

(3) Add from two to ten drops of glacial acetic acid and mix thoroughly.

(4) Add to the resulting solution one to two cubic centimeters of ether.

(5) To the ether extract add a few granules of guaiac resin.

(6) Add twenty to thirty drops of old water-white turpentine.

If the stain is due to blood a beautiful blue color develops, continues for about five minutes, sometimes longer, and gradually fades.

Much care must be observed in working with small blood-stains. Too much ether and water dilute the hemoglobin. I have been able to demonstrate a beautiful blue reaction with stains several months old, so small and so thin as to be almost unrecognizable—mere light-brown discolorations. The value of so sensitive a test in legal medicine will be apparent. It does not, of course, differentiate human from lower animal blood. If a stain is large the article tested can then be treated according to the directions given for stool examinations.

GENERAL CONCLUSIONS.

(1) Individuals eating an ordinary meat diet seldom give a reaction in the stools with the occult blood tests. If a reaction occurs it is in all probability due to some pathologic process in connection with the gastrointestinal tract.

(2) For a positive reaction to occur from the ingestion of uncooked meat, ten grams must have been eaten; usually twenty grams.

(3) For a reaction to occur in the stools after a hemorrhage from the esophagus or stomach, the hemorrhage must have amounted to at least 0.5 gram. With such a hemorrhage only a faint reaction is obtained. With one gram of blood a decided reaction occurs.

(4) The reaction always occurs in the first stool passed after the ingestion of pure blood or of food containing free blood. It seldom occurs in the second stool. It may occur as early as ten, and as late as twenty-one, hours after ingestion.

(5) The sensitiveness of the guaiac reaction is greatly enhanced if an equal amount of water is added to the ether extract employed, before the addition of the guaiac and turpentine.

(6) The diversity of results obtained by various writers and myself, leads to the conclusion that the results obtained by all can be duplicated if the proper conditions present themselves. In other words, when very minute amounts of blood are present a great variety of results will be obtained by all tests, with the same amount of blood, if experiments are made on successive days.

(7) The water modification is uniformly more sensitive than the Weber, Boas, or Klunge tests. All of the guaiac tests are more sensitive than the aloin test.

(8) A gradually appearing and fading color is the crucial test of a positive reaction. Any color, from a pale green to deep violet, that develops and fades, is positive.

(9) In medicolegal cases, when the question arises as to the nature of minute stains on articles of clothing, paper, et cetera, the water modification of the guaiac reaction will be found to be more sensitive than the Taylor method, so frequently referred to in works on legal medicine, and its application is very simple.

Ann Arbor, Michigan, Lawrence Building.

TABLE I.

SERIES I.—MEAT DIET.

No.	Character of Stool.	Ether Extract.	Boas.	Klunge.	Diagnosis.
1	Hard, formed, yellow		o	o	Hyperchlorhydria.
2	Formed, reddish brown		+	+	Chronic colitis.[1]
3	Dark brown, tenacious mucus		o	o	Neurasthenia.
4	Formed, grayish yellow		o	o	Peptic ulcer.[2]
5	Formed, grayish yellow		o	o	Dilatation of stomach.
6	Formed, yellow		o	o	Dilatation of stomach.
7	Soft, dark brown		o	o	Neurasthenia.
8	Formed, clay color		o	o	Gall stones, jaundice.
9	Soft formed, greenish brown		o	o	Tuberculosis, pulmonary.
10	Partly formed, dark brown		o	o	Sciatica.
11	Formed, dark brown, mucus		o	o	Chronic bronchitis.
12	Formed, dark brown		o	o	Sciatica.
13	Formed, light yellow		o	o	Simple goitre.
14	Partly formed, dark yellow	Clear yellow	o	o	Hyperchlorhydria.
15	Partly formed, dark yellow		o	o	Leukemia, splenomyelog.
16	Hard formed, dark green	Light yellow	o	o	Leukemia, splenomyelog.
17	Mushy, brown	Light yellow	o	o	Tuberculosis, pulmonary.
18	Hard-formed, reddish brown	Yellow	o	o	Bronchiectasis.
19	Mushy, yellow	Yellow	o	o	Tuberculosis, knee-joint.
20	Large cylinders, blackish brown	Smoky	+	+	Exophthalmic goitre.[3]
21	Semisolid, brown	Light yellow	o	o	Neurasthenia.
22	Constipated, brown	Yellow	o	o	Enteroptosis.
23	Large cylinders, brown	Yellow	o	o	Hypersecretion.
24	Semisolid, brown	Yellow	o	o	Stomach neurosis.
25	Semisolid, brown	Yellow	o	o	Neurasthenia.
26	Semisolid, brown	Yellow	o	o	Tuberculosis, knee-joint.
27	Formed, yellowish brown		o	o	Enteroptosis.
28	Formed, yellowish brown		o	o	Enteroptosis.
29	Formed, yellowish brown		o	o	Enteroptosis.
30	Formed, yellowish brown		o	o	Enteroptosis.
31	Formed, dark brown	Yellow	o	o	Leukemia.
32	Formed, light brown		o	o	Morphinism.
33	Constipated, brown		o	o	Neurasthenia.
34	Partly formed, dark brown		o	o	

[1] There had been visible blood in this patient's stool a day before the test was made.

[2] A few days after this test was made a positive reaction was obtained.

[3] There had been no suspicion that this patient was having hemorrhages from the gastrointestinal tract previous to this test. Her stools continued to give the reaction for some time. They were always of the same character until altered by treatment. The black color is due to bismuth. After stopping the bismuth and the stools became yellow, Doctor Roche made daily examinations and always found the test positive. There is a true hemorrhage in this case (Posterior nares). The reaction is not due to food eaten.

TABLE II.

SERIES II.—MEAT INGESTION.

No.	Name	Amount of Meat	Time Eaten	First Stool			Second Stool			Third Stool		
				Passed in	Boas Author's Mod.	Klunge	Passed in	Boas Author's Mod.	Klunge	Passed in	Boas Author's Mod.	Klunge
1	Mrs. G.	50 Grams	11 a. m.	21 hours	++	0	....	....	....	....	....	....
2	Mrs. G.	50 Grams	11 a. m.	20 hours	++	0	42 hours	0	0	72 hours	0	0
3	Mr. E.	40 Grams	11 a. m.	21.5 hours	+	0	40 hours	0	0	70 hours	0	0
4	Mrs. E.	30 Grams	11 a. m.	21 hours	+	0	70 hours	0	0	....	....	....
5	Mr. E.	20 Grams	11 a. m.	10 hours	+*	0	....	....	....	....	....	....
6	Mr. L.D.	15 Grams	11 a. m.	20 hours	?	0	....	....	....	....	....	....
7	Mrs. G.	10 Grams	11 a. m.	9.5 hours	0	0	24 hours	0	0	....	....	....

* A grass green color quickly appears, which intensifies to a deep green and very gradually fades away. The tests marked + showed distinct blue color; ++ Very decided deep blue reaction; ? A questionable reaction.

TABLE III.

SERIES III.

Mr. W., March 3, 1905.

AMOUNT OF FECES.	AMOUNT OF BLOOD. Drop Method	BOAS ORIGINAL TURPENTINE METHOD. GUAIAC REACTION.	KLUNGE ALOIN REACTION.
1 Gram	0.005 Gram	No change in color.	No change in color.
1 Gram	0.010 Gram	No change in color.	No change in color.
1 Gram	0.015 Gram		
1 Gram	0.020 Gram	Distinct greenish color.	Distinct but light cherry.
1 Gram	0.025 Gram	Distinct blue.	Distinct but light cherry.

TABLE IV.

Mr. McK., April 1, 1905.

AMOUNT OF FECES.	AMOUNT OF BLOOD. Drop Method	BOAS ORIGINAL TURPENTINE METHOD. GUAIAC REACTION.	KLUNGE ALOIN REACTION.
1 Gram	0.005 Gram	Light greenish tinge.	Questionable.
1 Gram	0.010 Gram	Light greenish color.	Very slight pinkiness.
1 Gram	0.015 Gram	Questionable.	Very questionable.
1 Gram	0.020 Gram	Positive blue.	Positive cherry.
1 Gram	0.025 Gram	Positive blue to purple.	Positive cherry.

TABLE V.

March 2, 1905.

AMOUNT OF FECES.	AMOUNT OF BLOOD. Drop Method	BOAS ORIGINAL TURPENTINE METHOD. R. F. A. GUAIAC REACTION.	KLUNGE ALOIN REACTION.
1 Gram	0.005 Gram	No change in color.	No change in color.
1 Gram	0.010 Gram	No change in color.	No change in color.
1 Gram	0.015 Gram	Greenish tinge.	Questionable.
1 Gram	0.020 Gram	Distinct green, pale.	Questionable.
1 Gram	0.025 Gram	Distinct blue to purple.	Distinct but light cherry.

TABLE VI.

Mrs. F., April 6, 1905.

AMOUNT OF FECES.	AMOUNT OF BLOOD. Exact Weight	BOAS TURPENTINE METHOD.*	KLUNGE ALOIN REACTION.
1 Gram	0.002 Gram	No change in color.	No change in color.
1 Gram	0.003 Gram	No change in color.	No change in color.
1 Gram	0.004 Gram	Light greenish tinge; fades.	Upper portion of tube opalescent, pinkish; lower, unchanged.
1 Gram	0.005 Gram	Light greenish tinge; fades.	Upper portion of tube opalescent, pinkish; lower, unchanged.
1 Gram	0.006 Gram	Light green, distinct; fades.	Upper portion of tube opalescent, pinkish; lower, unchanged.
1 Gram	0.007 Gram	Distinctly deeper green; fades.	Upper portion of tube opalescent, pinkish; lower, unchanged.
1 Gram	0.008 Gram	Suggestion of blue; fades.	Upper portion of tube opalescent, pinkish; lower, unchanged.
1 Gram	0.009 Gram	Pale smoky blue; fades.	Upper portion of tube opalescent, pinkish; lower, unchanged.
1 Gram	0.010 Gram	Pale blue; fades.	Upper portion of tube opalescent, pinkish; lower, unchanged.
1 Gram	0.015 Gram	Deep purple blue; fades.	Upper portion of tube opalescent, pinkish; lower, unchanged.

*A yellow, mushy stool. Dilute peroxid gives deeper colors.

TABLE VII.

Mr. D., April 5, 1905.

AMOUNT OF FECES.	AMOUNT OF BLOOD. Exact Weight	BOAS TURPENTINE METHOD.	KLUNGE ALOIN REACTION.
1 Gram	0.002 Gram	No change in color.	No change in color.
1 Gram	0.005 Gram	Light greenish color.	No change in color.
1 Gram	0.010 Gram	Positive green to blue color.	No change in color.
1 Gram	0.015 Gram	Deep purple blue.	Questionable pinkiness.

TABLE VIII.

SERIES III.—April 8, 1905.

AMOUNT OF FECES.	AMOUNT OF BLOOD. Exact Weight	BOAS GUAIAC, TURPENTINE METHOD.	BOAS GUAIAC, DILUTE PEROXID METHOD.	AUTHOR'S WATER, GUAIAC, AND TURPENTINE METHOD.	KLUNGE ALOIN REACTION.
1 Gram	0.004 Gram	Quick change to light green which gradually changes to pale, smoky blue.	Quick change to light green which very quickly fades without a suggestion of blue.	Beautiful light blue.	No change in color.
1 Gram	0.003 Gram	Absolutely no change in color. Test repeated several times.	Very quick change to grass green. No suggestion of blue.	Immediate change to greenish blue, which gradually changes to a pale blue with a green quality.	No change in color.
1 Gram	0.002 Gram	Absolutely negative.	Absolutely negative.	A distinct and quickly appearing flat green, with a suggestion of blue.	No change in color.
1 Gram	0.001 Gram	A very delicate green.	Absolutely negative.	A beautiful sky blue gradually develops.	No change in color.
1 Gram	0.0005 Gram	Absolutely negative.	Absolutely negative.	A very faint tinge of green. Absolutely no blue.	No change in color.

NOTE.—This patient's stools have been tested for several days as a control. They have always been negative with all tests. Control for above experiment was negative to all tests, The stool with which all these tests were made was soft, formed, and light yellow in color.

TABLE IX.

SERIES III.

AMOUNT OF FECES.	AMOUNT OF BLOOD. Exact Weight	BOAS GUAIAC, TURPENTINE METHOD.	BOAS TURPENTINE, GUAIAC, DILUTE PEROXID METHOD.	AUTHOR'S WATER, GUAIAC, AND TURPENTINE METHOD.	KLUNGE ALOIN REACTION.
1 Gram	0.004 Gram	Light green changing to smoky blue.	Pale green appears quickly, soon disappears. No blue.	Beautiful light blue.	Absolutely negative.
1 Gram	0.003 Gram	No change in color. Repeated tests.	A very quick change to distinct grass green. No blue.	Immediate change to greenish blue, gradually changing to a pale blue.	Absolutely negative.
1 Gram	0.002 Gram	Absolutely negative.	Absolutely negative.	A distinct and quickly appearing cloudy green with a suggestion of blue.	Absolutely negative.
1 Gram	0.001 Gram	Very faint green tinge which rapidly fades.	Absolutely negative.	A beautiful sky blue gradually appears and disappears.	Absolutely negative.
1 Gram	0.0005 Gram	Absolutely negative.	Absolutely negative.	A beautiful delicate sky blue.	Absolutely negative.

NOTE.—The stool with which all these tests were made was of a light yellow color and thoroughly soft throughout. It was a semiformed stool and the blood could be triturated into it in a most thorough manner.

ORIGINAL ABSTRACTS.

MEDICINE.

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A MYDRIATIC SUBSTANCE IN THE URINE OF NEPHRITICS.

Professor Doctor J. Pal (*Deutsche medicinische Wochenschrift,* October 17, 1907) writes concerning a substance in the urine of nephritic patients which produces mydriasis when dropped on the enucleated eyes of frogs. He suggests that this reaction might be due to the presence of adrenalin. His results are as follows:

Normal cases,	7.	Per cent positive,	0.
Nephritic cases,	28.	Per cent positive,	78.
Other diseases,	28.	Per cent positive,	7.
Pregnant cases,	18.	Per cent positive,	33.

D. M. C.

SURGERY.

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THE TECHNIQUE OF DIRECT TRANSFUSION OF BLOOD.

As a pioneer in this department, Crile has developed a method that promises to meet many emergencies. In *Annals of Surgery* for September, 1907, he presents a paper based on two hundred twenty-five experiments on animals and thirty-two clinical cases. He found that transference of blood from vein to vein, though easy of technique, was uncertain in the rate of flow and had little power of overcoming resistance. By using an artery of the donor the blood was driven across under a certain amount of pressure, with a uniform rate of flow, readily overcoming a certain resistance and supplying fresh oxygenated blood. In using the peripheral artery of the recipient, it was found that the back pressure and peripheral resistance interfered with the free flow, and the valves of the peripheral veins interfered with the flow from the artery of the donor. He has therefore adopted the direct channel to the right heart, and by Mixter's device of a canula with two grooves he has been able to secure contact of intima with intima without the possibility of any foreign body coming in contact with the blood stream. In application, after preliminary administration of morphin and preparation of arms of both donor and recipient, and placing them upon operating tables with heads in opposite directions, by infiltration anesthesia of 0.1 per cent solution of cocain, he exposes about three cubic millimeters of the radial artery, applies a "Crile" clamp to proximal end, ligates distal end, divides it, and pulls adventitia over free end as far as possible and snips it off. The same procedure is carried out on a superficial vein of the recipient. Through a canula larger than the vessels the free end of the vein is pushed, turned back like a cuff and tied in the second groove. The artery is now pulled over the vein and tied in the first groove. This completes the anastomosis. Clamps are removed and the blood begins to flow. The blood lost by the donor is regained in from four to five days. The aomunt transferred is under the immediate control of the operator. The rate of transference should be carefully gauged because of the risk of overcharging the pulmonary circulation. F. B. W.

GYNECOLOGY.

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PATHOLOGICAL CHANGES CAUSED BY THE GONOCOCCUS.

ANSPACH (*American Journal of Obstetrics,* Volume LV, Number IV) devotes an article under the above title to a brief consideration of the gonococcus and to the pathologic changes incident to infection by this organism.

The germ almost always occurs in pairs, the opposed surfaces being flattened and the line of division parallel with the long axis of the cells. It is often found in the pus cells or in epithelial cells and free outside. Ordinary culture methods fail to develop a growth of the micrococcus, special media containing exudates being necessary. Aside from its specific action, due to a bacterial protein, the gonococcus produces pus, either free on mucous surfaces or confined in the deeper tissues. The toxic materials elaborated by the gonococcus may be transported to various distant tissues such as the joints, the nerves, et cetera, giving rise to typical disease processes. Lower animals, while reacting to the injection of the gonotoxin, are not susceptible to an inoculation of the organism. There seems to be no immunity, either natural or acquired, in man to gonococcus infection.

Gonorrheal infection is acquired through the mucous surface, usually of the genital organs. It very rarely is found on other than cylindrical epithelium. The organism may persist for a long time after symptoms have disappeared and under favorable conditions regain its activity, causing reinfection of the same or other person.

Gonorrhea, in women, is usually at first confined to the urethra, the glands of Bartholin, and the cervical crypts. It is not as painful as in man, often existing for some time without being noticed. Gradually extension by continuity occurs and involvement of cervix, the uterus, tubes, peritoneum, bladder and kidneys may be the final outcome. In children gonorrheal infection is, according to the author, "a veritable scourge," spreading in hospitals uncontrolled unless the strictest quarantine is maintained. The statistics of Holloway, in the Philadelphia Hospital, are taken to show that fifty per cent of the eyes affected with gonorrheal infection are lost.

The gonococcus may enter the lymph channels and cause a variety of lesions. It has been found free in the circulating blood. Thayer reports two fatal cases of endocarditis in which the germ was found as the cause; he also cites a case of gonorrheal septicemia which clinically resembled typhoid fever. The writer mentions a case of his own of gonorrheal metastatic mastitis. The organism has also been found in the ovary, in the rectal mucosa, in the subepithelium of the vagina, in the uterine muscle, in the decidua and placenta, and in purulent collections in various parts of the body.

According to Johnson the mortality of gonorrheal infection is high when we consider the operations done on its account, and the number of abortions due to this cause, in addition to deaths resulting directly to the infection. C. G. P.

Jackson, Michigan, The Colony.

PEDIATRICS.

ARTHUR DAVID HOLMES, C. M., M. D.

THE USE OF CITRATE OF SODA AS AN ADDITION TO COW'S MILK IN THE INFANT DIET.

Van Derslice says (*Pediatrics,* September, 1907) citrate of soda has been demonstrated to be of distinct value in modifying cow's milk for infant feeding, under the following conditions: (1) For weaning a healthy infant; (2) For increasing the amount of milk taken in twenty-four hours; (3) For correcting milk dyspepsia; (4) For the avoidance of scurvy. The author's guide for the use of citrate of soda is the condition of the stool, the body weight, and the mother's report of the condition of the child. If indigestion persists, he increases the dose of citrate of soda, the average being one grain to the ounce of milk. The author does not use citrate of soda in percentage modified milk, but would advocate one grain to each twenty-four grains of proteid in the mixture.

The advantages of this method of feeding are: It renders the curd of cow's milk finer and more digestible. It is simple and cheap. It is convenient and easily administered. It allows giving milk more concentrated with less danger of overfeeding. It is given as a medicine, gaining the confidence of the mother. He prescribes as many grains to the drachm as he is giving ounces of milk to the child, and orders a teaspoonful in each feeding.

OTOLOGY.

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EUSTACHIAN TUBES IN INFANTS.

KERRISON (*Laryngoscope,* Volume XVII, Number IX) notes the great prevalence of suppurative middle ears in children and the greater difficulty in bringing about a permanent cure, and suggests, in explanation of these facts, the following anatomic differences between the infant and adult tubes.

(1) In the infant the tube is shorter, not over fourteen or fifteen millimeters; adult thirty-three to thirty-eight.

(2) Calibre same as in adults, and in proportion to its length much wider.

(3) No demonstrable angle between bony and cartilaginous portions, rendering tube straight.

(4) Nearly horizontal course of tube.

(5) Pharyngeal opening below hard palate in infant.

From these facts it would seem that the entrance of germs either from inspired air or from nasal secretions draining posteriorily is rather favored.

When the suppurative process is clearly complicated by adenoids in the vault the author favors a removal of the growths at the time of paracentesis, believing that the risks incurred are less than those resulting from the usual postponement of the adenoid operation.

M. L. C.

LARYNGOLOGY.

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CHRONIC LARYNGEAL DISEASE.

AMONG the many articles that have been written lately upon the diagnosis and treatment of chronic diseases of the larynx, none are more important than those which deal with the differential diagnosis of syphilis, tuberculosis, and cancer. In the March number of the *Annals* *of Otology, Rhinology and Laryngology,* Sir Felix Semon discusses the subject under the caption, "Some Points in the Diagnosis and Treatment of Laryngeal Cancer." In a brief abstract it is impossible to even mention the many important points brought out in his discussion. His exceptionally large experience enables him to speak with more than ordinary authority. A review of the progress made during the past quarter of a century makes him more hopeful as to permanent cure if the cases be diagnosed early and thoroughly operated upon. He dwells at length on the points of differential diagnosis between syphilis, tuberculosis, and cancer. Defective mobility, in his opinion, is a very important sign. He formulates his rule as follows: "If the vocal cord from which a suspected laryngeal growth springs shows at an early period of the disease a defect of mobility other than due to the mechanical impaction of the growth in the glottis on phonation, this sign is almost pathognomonic for the malignant character of the tumor. If, however, this sign should yet be absent when the case comes under observation, such negative evidence does by no means exclude possible malignancy." It has been found that this sign,—defective mobility,—occurs also in syphilis and tuberculosis, so that its value is in differentiating the benign inflammatory affections from the malignant ones.

Semon advocates thyrotomy as giving these patients the best chance. Total laryngectomy he believes to be too mutilating an operation to be advised, as the pitiable condition in which the patient is left makes life almost unendurable. Under the heading, "Differential Diagnosis of Tuberculosis, Syphilis, and Malignant Disease of the Larynx," *Journal of Laryngology, Rhinology and Otology,* November, 1907, Semon again discusses this subject with his usual clearness. He touches upon the following points:

(1) Congestion of the vocal cords as an initial sign of tuberculosis, syphilis and malignant disease: (a) Bilateral; (b) unilateral.

(2) The difficulties of diagnosis between tuberculosis, syphilitic and malignant laryngeal tumors.

(3) Laryngeal tuberculosis in middle-aged or old people as a source of error in the differential diagnosis between tuberculosis, malignant disease and syphilis of the larynx.

(4) Difficulties in the differential diagnosis between all three diseases when appearing in the form of infiltration.

(5) Combination of two of the diseases under consideration, and consequent diagnostic difficulties.

* * *

In the same number of this journal W. Jobson Horne discusses the differential diagnosis of these three diseases. Four subjective factors are taken into consideration:

(1) Pain: Is it constant or intermittent?

(2) Vocal function: Has it been impaired previously, and, if so, after what interval of immunity was there recurrence?

(3) Is there any evidence of fibrotic degeneration? What is the condition of the urine?

(4) Has the larynx recently undergone any local treatment?

In a similar manner the objective signs are discussed under four headings:

(1) Those cases in which there is only congestion of the laryngeal mucosa, and perhaps impaired mobility of a vocal cord. The congestion may be patchy and limited to only one part, or it may be diffuse and involving both sides. The paresis may be bilateral.

(2) Those cases in which there is (perhaps in addition to congestion and impaired mobility) some tumefaction, if not a definite tumor or excrescence.

(3) Those cases in which, in addition to congestion, impaired mobility and tumefaction, there is ulceration.

(4) And lastly, those in which there is external evidence of disease, such as glandular enlargement.

Horne believes that a knowledge of the histology of the mucous membrane of the larynx aids in differential diagnosis, and more particularly the understanding of the distribution of the two varieties of epithelium, the columnar, and the tessellated, which line the larynx.

This author makes a special point in eliminating tuberculosis from the diagnosis, so the problem resolves itself into a diagnosis between syphilis and malignant disease, then by the use of iodide of potassium in large doses he eliminates syphilis. He urges early diagnosis, and rightly says that we are dealing with the three most dreaded diseases of the larynx; all three are amenable to arrest, if not to cure.

In the discussion—

Doctor Birkett said that tuberculin had been of service in the diagnosis of tuberculosis of the larynx.

Doctor Tilley reported a case where the examination showed it to be malignant disease of the larynx. After consultation it was decided to open the larynx. The tumor was found to be unlike an epithelioma, and upon section it was found to be tubercular. He also said that fixation of the cord was not absolutely essential to malignant disease.

Doctor Grant said that a unilateral congestion of the vocal cord was suggestive of tuberculosis in the very early stages, but if the condition was unilateral at a late stage it was probably not tuberculous.

* * *

Other recent contributions to the literature of malignant diseases of the larynx are: "Modern Procedure in Excision of Intrinsic Malignant Growths of the Larynx," by Doctor J. Solis-Cohen. He advocates thyrotomy after a preliminary tracheotomy. "Epithelioma of the Larynx; Total Laryngectomy, including the removal of part of the Trachea. Death from pneumonia on the thirteenth day," by Doctor C. F. Theisen. "Nonrecurrent Carcinoma of the Larynx (Removed Through the Natural Passages)," by Doctor E. Fletcher Ingals. These three papers are published in the June, 1907, number of the *Annals of Otology, Rhinology and Laryngology.*

PROCTOLOGY.

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SHORTENING OF THE MESOSIGMOID FOR EXTENSIVE PROLAPSE OF THE RECTUM AND SIGMOID FLEXURE.

HIRSCHMAN (*Detroit German Polyclinic Monthly,* Volume I, Number V) describes a new procedure which he has devised for the relief of aggravated prolapse of the rectum and sigmoid. After discussing the various degree of prolapse he goes on to say:

In procidentia of the third degree a serious problem presents itself; and that is the fact, that the telescoping of the sigmoid and upper rectum into the lower ampulla shows that the normal supports of the bowel above have been so stretched that they no longer keep it in its proper position. Here any procedure which aims to cure the condition must be of such a nature that the prolapsed sigmoid and rectum are brought back into their natural position and held there *by their natural supports.* This means that whatever mode of procedure is adopted it must be done from above, and through an abdominal incision. Various operations for attaching the sigmoid to the abdominal wall, or to the posterior wall of the pelvis have been advocated, as well as the infolding of the gut to narrow its lumen, and, while some successes have been reported, recurrences due to the stretching of the adhesions formed, and nonrelief due to immobility of the bowel due to too extensive adhesions have been so frequently met with, as to warrant the supposition that there was something more to be desired in the way of treatment of these cases.

As in operations on the retroverted uterus, the shortening of the natural supports of the womb have superseded the illogical attachment to the anterior abdominal wall; so it is hoped that the shortening of the mesentery, the natural support of the bowel, as advocated by the writer, will replace the old fixation methods in the condition under discussion. In this connection, and in order to show how effective this methid is in cases where other methods were tried and found wanting, a case in point is presented and the technique described:

Under hyocine-morphin anesthesia, fortified with a small quantity of chloroform, the abdomen was opened a little to the left of the median line. Nearly one-half of the sigmoid flexure was found telescoped into the rectum and the space formerly occupied by the uterus filled with the rest of the prolapsed sigmoid. The stump of the right broad ligament was found firmly attached to the sigmoid, thus holding the lower part of it in the prolapsed condition. The mesentery of the sigmoid was very much elongated, allowing the bowel to remain in the lower pelvis. The adhesion was separated and the stump of the broad ligament covered over with peritoneum, the prolapsed bowel lifted out of the pelvis, and the outer surfaces of the mesentery of the large loop of the sigmoid lightly scarified. Beginning towards its deep attachment (about six inches from the bowel in this case), the two opposing surfaces of the mesosigmoid were brought together by interrupted twenty-day catgut (number two) sutures. Three rows about an inch apart were placed in this manner, the upper row being three inches from the bowel. As the sutures were tied the sigmoid and rectum were lifted from their prolapsed position.

For fear that the curve on the loop might be lessened and possible kinking taking place (a rather remote possibility on account of the strength of the adhesions), the longitudinal muscular band of the sigmoid, together with an eighth-inch of the serous and muscular coats of the bowel on either side of the band, was rolled in upon itself by transverse interrupted catgut sutures, placed three-quarter-inch apart around the curve, and for two inches beyond at each side. This rolling in of the muscular band made a rib of firm muscular tissue which materially increased the size of the curve, and greatly strengthened it.

The scarification of the sutured surfaces of the mesosigmoid gave assurance of an adhesive surface of over eighteen square inches, and yet allowed perfect motility of the organ. The abdomen was closed, the rectocele reduced and repaired, and the prolapsed and mucous membrane resected.

In the after care of the case he states that the patient was kept on her back for ten days, on a restricted assimilable fluid diet; and her bowels not allowed to move during that time. On the eleventh day she was given an oil enema, preceded, the night before, by a small dose of compound licorice powder; and she had a nice easy movement. She was allowed to turn on either side supported by pillows, and at the end of the fourth week was allowed to walk and partake of full diet. She left for her home at the end of six weeks, having good daily evacuations of the bowels without cathartic or enema.

Five months after the operation she called at his office, while on a visit to the city, and he had the opportunity of examining her. Everything was in perfect condition; she had daily stools, without any assistance (after thirty years of constipation), and stated that her health in every way was perfect since the operation.

MEDICOLEGAL.

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THE RIGHTS OF A PHYSICIAN TO RESTRICT HIS PRESCRIPTION.

THE physician has the same rights to place restrictions on his prescription when he transfers it to his patient as the owner of real estate has when he deeds away his property. If a deed is given on conditions that no liquor be ever sold on the premises, such restrictions must be obeyed. The physician can do likewise when diagnosing and prescribing for his patient. The physician is the only person who can legally place limitations on his prescription. It makes no difference how much a pharmacist may wish to control a prescription, it is impossible for him to do so without running many risks legally. The physician had better have printed on the back of his prescription blanks something similar to the following: "This prescription is intended for the present indications only, and is not to be renewed without the written consent of the physician." The druggist should place the following sticker on all prescriptions having a restriction on them: "Your physician directs that this prescription is not to be renewed without his consent." This places the responsibility of the restriction where it justly belongs, and has a restraining influence over the patients. We realize the injustice done to the honest pharmacist by all such notices, for they do the proper thing without warning, but there are pharmacists who are not honest. Let me cite an instance of the renewal of prescriptions related in the *Bulletin of Pharmacy*.

"A regular prescription was written for a legitimate emenagogue pill for legitimate purposes, with favorable results. This was several years ago. Recently the physician was in the store where the prescription was filled and noticed the woman having it refilled. Upon interrogating her he found that she was having it renewed repeatedly, paying forty cents for it; and after placing the pills in plain boxes was selling it to her friends for two dollars a box. He had given her the means of carrying on this traffic by means of a mercenary-minded pharmacist, for which he had received a fee of fifty cents. He dispenses almost exclusively in his office now, largely as a result of this incident."

DOCTOR BILLS IN DETROIT.

THERE is a law in Michigan that bills against an estate of a deceased person which do not exceed twenty dollars, if disallowed by the commmissioners cannot be appealed. A Detroit doctor recently presented a bill against an estate for ten dollars, which the commissioner disallowed, and it could not be appealed. The duty of Detroit doctors is obvious. They should not render a bill against a Michigan estate for less than twenty dollars.

EDITORIAL COMMENT.

DELIBERATIONS OF DERMATOLOGISTS.

Although dermatology is reckoned one of the older divisions of medicine the youthful vigor which pervades this important specialty, particularly in the United States, is manifest in the lengthy deliberations conducted by the Sixth International Dermatological Congress which lately convened in New York City. About two hundred members, representing nearly every civilized country of the world, were registered at this meeting, which was held in the Academy of Medicine from September 9 to 14. The event was noteworthy because of the large number in attendance and the many practical papers listed in the excellent program, prepared by the Organization Committee, which provided material for discussion throughout the week.

The address of welcome was delivered by Surgeon-General Rixey, of the United States navy, who represented President Roosevelt. President Ira Remsen, of Johns Hopkins, spoke for American universities; Doctor Joseph D. Bryant, president of the American Medical Association, spoke for the medical profession of the United States; and Doctor James C. White, of Boston, president of the organization, responded in behalf of the congress.

The themes selected for formal consideration by the congress were included under three main captions.

I.—The etiologic relationship of organisms found in the skin in exanthemata.

II.—Tropical diseases of the skin.

III.—(a) The possibility of immunization against syphilis; (b) The present status of our knowledge of the parasitology of syphilis.

In addition to the papers and discussions contemplated in this scheme there were between fifty and sixty other papers covering a wide range of topics, important among which considered the reaction of the rat to inoculation with leprous tissue; the diminution and treatment of lupus; the treatment of lupus and of lupus erythematosus; the pathology of the brown-tailed moth dermatitis; multiple idiopathic hemorrhagic sarcoma; observations on skin diseases in the negro; the opsonic method in skin diseases; blastomycosis of the skin; systemic dermatitis coccidiosis; some American parasites of the skin; tropical ulcers of the Philippines; infections due to massage; the therapeutic effect of radium in dermatology and of the *x*-rays in various conditions, with a report of eight hundred cases subjected to high frequency currents and to liquid air. This galaxy, together with various other papers on kindred subjects, will impart an idea of the broad scope of the discussions.

Perhaps the most interesting and valuable feature of the congress was the exhibition of hundreds of patients, manifesting almost every variety of skin disease, which was scheduled from 9 to 11 o'clock for four mornings in the week, and the presentation and discussion of dermatologic cases either rare or remarkable, which precipitated some sharp difference of opinion as to diagnosis. The elucidation of many skin diseases was aided by photographs which covered the walls, and by the presence of a goodly number of casts, as well as some beautiful wax preparations of dermatologic disease of the extremities which were exhibited by Doctor Taylor, of Liverpool.

The entertainment and social features of the congress were supervised by the American Dermatological Association, as hosts, in which the New York members were conspicuous for their characteristic hospitality. A reception by the president, Doctor White, was given in the Waldorf, on the first evening, which was attended also by the ladies of the members of the congress. Doctor and Mrs. L. Duncan Bulkley tendered a reception to the members of the congress, which also included the ladies, at their Madison Avenue residence. One afternoon and evening was dedicated to a steamboat ride on the Hudson and East rivers, the harbor and outer bay, and a seafish dinner at Coney Island. The visiting ladies were also entertained by the wives of the resident New York members. Taken as a whole, the occasion afforded a week of profit and pleasure that well recompensed for the time devoted thereto.

W. F. B.

ANNOTATIONS.

THE ANGLO-AMERICAN MEDICAL ASSOCIATION.

Doctor Victor C. Vaughan, dean of the medical department of the University of Michigan, recently addressed the members of the Anglo-American Medical Society of Berlin, Germany. This organization is composed of English-speaking physicians from the United States, Canada, and Great Britain engaged in practice in the German metropolis. The object of its existence is to furnish assistance to its members and information and guidance to transients pursuing study in Berlin. Indices of the various courses obtainable, together with details as to the price of each, topics discussed, hours, et cetera, are at the disposal of visiting doctors, who likewise have access to the library of the society. Meetings are held every Saturday afternoon, the address usually being delivered by some eminent visitor or by a professor from the University.

ISOLATION OF BACILLUS LEPRA FROM INSECTS.

Investigation of leprosy is being diligently pursued in Hawaii since the advent of American control. Formerly the most effective means of handling the disease was segregation of the infected to Molokai, without regard to etiology or cure, but the recent establishment of a Leprosy Investigation Station at the settlement has marked a new era in the management of lepers. Goodhue, resident physician to the colony at Molokai, has lately conducted a series of experiments bearing on the relation of bedbugs and mosquitoes to the malady, and has succeeded in demonstrating the presence of the bacillus in the bodies of the insects. The work was performed with a dissecting microscope and sterile teasing needles, the abdominal contents being teased out. After crushing between sterile slides and staining the bacillus lepra was readily observable. Not only is the disease transmissible through the medium of insects, but the large number of washerwomen among lepers affords ready means for its propagation.

CEREBROSPINAL MENINGITIS COMPLICATING PREGNANCY.

Pregnancy, complicated by cerebrospinal meningitis, is reported, by Williamson, in a girl fourteen years of age, who was admitted to Ulster Hospital for Children and Women, Belfast, evidencing every manifestation of labor. Peculiar about the case was the fact that patient had never menstruated. The day subsequent to her admission at 2 o'clock A. M. she was seized with severe pains in the back and abdomen, accompanied by vomiting. After several hours' suffering the attending physicians decided that the child was in labor, but this she declared impossible. Temperature soon reached 101°, and the pulse, which was full and bounding, reached 100. Herpes was present about the mouth and nose, and the cheeks were slightly cyanosed. These manifestations, which were accompanied by a wild and excited expression, continued until 3:50 P. M., when death ensued. During the entire period patient was perfectly conscious. Autopsy revealed a congested condition of the meninges, with dilated blood-vessels. The vesicles contained a surplus amount of serous fluid and the internal vessels were markedly congested. The uterus contained a full term male child. Throughout the body the viscera were markedly inflamed.

CONTEMPORARY.

WHY PHYSICIANS DO NOT PRESCRIBE "UNITED STATES PHARMACOPŒIA" AND "NATIONAL FORMULARY" PREPARATIONS.

[THE MEDICAL BRIEF.]

The author of a paper which recently appeared in the *Alumni Report*, published by the Alumni Association of the Philadelphia College of Pharmacy, says that as a result of the examination of one thousand prescriptions from two of the leading drug stores of Philadelphia, he found that thirty-five per cent contained proprietaries. Mr. Edward Bok, the editor of the *Ladies' Home Journal,* who has taken it upon himself to give instructions to physicians, examined one hundred prescriptions in the same city, forty-two of which contained proprietaries. Mr. John B. Thomas, of Baltimore, according to our author, examined the prescriptions from six sections of his city, five hundred from each section, and found about the same proportion of proprietaries were prescribed in Baltimore as at Philadelphia. Now, why is it that, in spite of a foolish agitation against proprietaries, physicians keep on using them? The answer is plain. They have, by experience, found that they gave satisfactory results. They know them to be uniform, and, having in view the restoration of their patients to health, they, as practical, honest men, use those agents which they think will most certainly secure this end.

The writer of the article to which we have referred deplores the fact that physicians will continue to go on prescribing proprietaries instead of the "United States Pharmacopœia" and "National Formulary" imitations. He says he cannot see how educated physicians will insist on using proprietaries when there are nine hundred fifty-eight official preparations in the "Pharmacopœia" and four hundred eighty-six in the "National Formulary." Unwittingly, he answers his own question. Without intending to do so, he solves the problem himself. For later on in the same paper, he says that pharmacists, as a class, are ignorant, both of the "Pharmacopœia" and the "National Formulary." He says:

"Ignorance of the 'Pharmacopœia' and 'National Formulary' is also applicable to the pharmacist. Within the past week I saw a letter written by one of the leading wholesale and retail drug establishments, in a large city near the center of this enlightened commonwealth, to a pharmacist here in Philadelphia, asking him what Liquor Ceresolis Compositus was and *who prepared it.* Last fall, after the 'Pharmacopœia' had been official for over a year, the chief prescription clerk of one of the leading drug stores of Philadelphia called me on the phone and asked the same questions relative to this preparation. *I could enumerate numerous instances of this kind, but these will suffice.*"

Now, even if doctors *wanted* to use the so-called official preparations exclusively, they would not take the risk of prescribing them if the druggists, even in a city like Philadelphia, who live right in the shadow of the best pharmaceutical college in the world, are so ignorant (as this writer says) as not even to recognize them when they are prescribed. And if they do not know them by *name,* how in the name of heaven can they be depended on to compound them? Physicians are well aware of the deficiencies of the druggists, according to our author, and regret it; and yet they must recognize it as one of the conditions of this commercial age, and the druggists can hardly be blamed for its existence. Why, how can a druggist be expected to know all the numerous official preparations and how to compound them? The fact is, it has reached the point when the medicine sold in the average drug store does not amount to over twenty-five per cent of its total sales. Medicine in a drug store has, indeed, gotten to be a "side line." The bulk of the sales is made up of soda-water, confectionery, toilet articles, stationery, postcards, and thousands of other articles in no way connected with medicine. Under these circumstances it would be folly to expect any one druggist to carry in stock all the drugs contained in the one thousand five hundred official preparations; or, if he carried them all, and kept them in good condition, it would not be practicable for any one man to be able to skilfully compound so many preparations, and especially when the sale in them constitutes so small a proportion of his total business. But our author gives a still stronger reason why physicians can not afford to stick to the official preparations, for he tells us that: *"A large number of pharmacists do not possess a copy of the last 'Pharmacopœia,' and only a small number, comparatively, possess a copy of the third edition of the 'National Formulary.'"*

Now, in the name of common sense, how are they going to compound the preparations named in these books when they have not even in their possession copies of them?

It is this state of affairs in the drug trade, and the consequent inability of the doctors to get their prescriptions compounded accurately and with uniformity, that has caused them to turn to and rely on the ethical proprietaries. These, he *knows,* are always the same.

MEDICAL NEWS.

MEDICAL DEPARTMENT STILL AT ANN ARBOR.

So many rumors have been set afloat about the removal of the Medical Department of the University of Michigan that the following incident is easy to understand. The volumes of the "Index Catalogue of the Surgeon General's Library" have been sent to the University Library as they are published. As the last volume did not reach the library by the usual time, the librarian notified the Public Printer in Washington. It then appeared that a physician in a neighboring city had written to the Printer for a copy, and as the official did not suppose this could be wanted away from the University he concluded the latter had moved, and so sent the volume to a larger town—West!

MINOR INTELLIGENCE.

At the annual meeting of the Detroit Academy of Medicine on October 8, the following officers were elected: President, Doctor Frank B. Tibbals; vicepresident, Doctor William F. Metcalf; secretary-treasurer, Doctor Harrison D. Jenks.

THE recent election of the American Hospital Association resulted in the return as secretary of Doctor W. L. Babcock, Superintendent of Grace Hospital, Detroit.

THE National Committee for Holland to this year's International Congress on Tuberculosis will be Doctor P. K. Pel, president, and Doctor B. H. Vos, secretary.

THE silver medal of the Carnegie Hero Fund Commission has been awarded to Doctor Lochlin M. Winn, of Anniston, Alabama, for saving three persons from drowning at Clayton, Alabama.

DOCTOR PRESTON M. HICKEY, of Detroit, was elevated to the presidency of the American Roentgen Ray Society at the annual meeting of the organization in Cincinnati, October 2, 3 and 4.

THE Governor-General of Algeria is agitating the establishment of an Algerian University. Many persons who have inspected the common schools of Algeria have reported favorably for the establishment of an institution of higher learning.

DOCTOR ROGER SYLVESTER MORRIS, formerly instructor in internal medicine at the University of Michigan, and now occupying a similar position in Johns Hopkine Hospital, was married to Mary Bledsoe Carter in Baltimore on September 10, 1907.

THE authorities of Saint Luke's Hospital, New York, have filed plans with the Building Department for an annex in the form of a roof garden to cost $20,000. The garden will be located on the Muhlenberg Pavillion of the central administration building.

TEN new meat inspectors have been appointed in Pennsylvania. The addition was necessary in order that the new law regulating the meat traffic might be more rigidly enforced. The work is under the direction of Doctor Leonard Pearson, state veterinarian.

SOME munificent fees were received by alienists for expert testimony in the late Thaw trial. The following have been sanctioned by the controller: Doctor Carlos F. MacDonald, $6,300; Doctor Austin Flint, $5,315; Doctor William Maybon, $3,987; and Doctor Robert C. Kemp, $3,102.

THE New York legislature at the last session passed a law regulating the sale of cocain. Henceforth it will be illegal for druggists to retail the drug unless upon written order in the form of a prescription from a duly qualified physician. The law likewise applies to alpha and beta cocain.

WITH the usual Oriental procrastination, Persia, notwithstanding seventy-five thousand deaths annually from smallpox, is without a vaccine laboratory. The condition is the more deplorable since funds are at hand for the erection of a laboratory and plans have been ready since 1905.

THE astounding increase of 237.2 per cent in cases of mental derangement is recorded in English statistics for the last half century. Since 1859 the number of cases has increased from 36,762 to 123,968. Inasmuch as the increase in population has been only 77.5 per cent the condition is alarming.

THE suicide of Lucian M. Underwood, Torrey Professor of Botany at Columbia University, while suffering from melancholia, is reported from his home at Redding, Connecticut. Doctor Underwood was one of the foremost botanists in the world and stood at the head of his profession in America.

THE Mary Kingsley medal was recently awarded to Doctor Carlos Finlay, chief of the department of health and sanitation of Havana, in recognition of his work on the transmission of yellow fever by mosquitoes. The medal is awarded by the Liverpool School for the Study of Tropical Medicine.

THE annual custom at the Massachusetts General Hospital of observing "ether day" was celebrated on October 16, this being the sixty-fifth anniversary of the discovery of ether as an anesthetic. Lunch was served in the Bulfinch Building, and the new orthopedic ward was opened for inspection.

TUBERCULOSIS gains little headway in London, notwithstanding the inclement weather conditions incident to the geographic location of the world's metropolis. In 1904 the death rate from the disease was but 166 in 100,000; in Berlin 257; in Milan 254; in Madrid 256; in Vienna 314; in Paris 383; and in Moscow 387.

GOVERNOR STUART, of Pennsylvania, recently vetoed a bill to amend the present vaccination law. The amendment provided that certificates of successful vaccination or of having had smallpox shall not be required when smallpox is not known to exist. The governor held that the words "known to exist" were not definite.

A COLLEGE of Medicine, whose curriculum shall represent only the first two years of a medical course, has been instituted at the University of Wisconsin. Two years of college work are required for admission, Latin, French, German, physics, chemistry, and biology being compulsory. The dean is Doctor C. R. Bardeen.

MAJOR JAMES CARROLL, M. D., Curator of the Army Medical Museum and professor of bacteriology and clinical microscopy in the Army Medical School, died in Washington, District of Columbia, on September 16. Doctor Carroll was born in England and was a graduate of the University of Maryland, class of 1891.

HEALTH conditions in the canal zone are indeed gratifying. No case of yellow fever has appeared in the past five months. Stringent efforts are being made to check malaria, and as only a few cases have been reported, drainage of swamps and the destruction of larvæ at present being undertaken, will likely bring about the desired result.

Doctor Funk, the well-known psychologist of New York City, is of the opinion that crime is as infectious as smallpox or any other morbid condition; that one crime is followed by another; and that criminality moves in waves. He attributes its increase to the obnoxious yellow press and to the rapid influx of the hot-blood races of lower Europe. Swift and extreme justice is suggested as a remedy for the condition.

Doctor Francis Hartman Markoe died at his home in New York City on September 13, aged fifty-two years, the cause of his demise being aortic aneurysm. Doctor Markoe was a graduate of the New York College of Physicians and Surgeons, and had for many years capacitated as attending physician to New York and Saint Luke's Hospitals, besides being a member of the surgical staff of the College of Physicians and Surgeons.

Surgeon-General Preston M. Rixey, of the Navy, has recommended the issuance of an order by the Navy Department forbidding indulgence in cigarettes by sailors under twenty-one years of age. In three months on one battleship one thousand two hundred pounds of tobacco, one thousand five hundred books of papers, and thirty-seven thousand cigarettes were consumed, and the doctor considers the situation alarming.

After a continuous service of forty-six years as director of the Vienna clinic and professor of otology in the University, Doctor Adam Politzer has tendered his resignation. His last lecture was attended with some ceremony, representatives of European and American otologic associations being present. Doctor Urbantschitsch, who until recently was director of the ear department of the Vienna polyclinic, will succeed Doctor Politzer.

One of the periodic setbacks accorded to charlatanism was recently received by Christian Science in New Jersey, when a jury at Mount Holly rendered a verdict of guilty in a trial for manslaughter against Mr. and Mrs. Edwin M. Watson. Defendants' child died of meningitis in May, after having been treated by an Eddyite healer, a physician being called only at the extreme moment. The maximum penalty in New Jersey for manslaughter is fifteen years. The case has been appealed.

Following the recent recommendation of the American Medical Association, the Medico-Chirurgical College, of Philadelphia, has established a five-year course of study. At present its pursuance is optional, but the shorter course is so arranged that students who have not had the advantage of college training or of graduation from an approved high school or academy, will find its election advisable. Chemistry, physics, biology, German, pharmacy, materia medica, histology and osteology will be included in the work of the fifth year.

The new Philippine Medical School formally opened its doors on June 10, with an enrollment of fifty-four students. The curriculum of the school is arranged according to American standards, and through its work a general uplifting of medical science in the islands is anticipated. Already the medical school of Santo Tomas University has inaugurated reform, a new dissecting room and several laboratories being in process of construction.

In a paper read before the last International Congress of Hygiene and Dermatology at Berlin, Doctor Simon Baruch made a plea for the more general establishment of public baths. While appreciating the exhilarating effect of river bathing, the doctor urged the fact that propriety demanded that the participant be partially clothed, thus militating against absolute cleansing, the direct application of soap being necessary for the removing of impurities.

RECENT LITERATURE.

REVIEWS.

MODERN MEDICINE.*

With these two volumes we see the auspicious beginning of a large undertaking, a comprehensive system of internal medicine. Although not wholly American, it is so largely American that it may be looked on as the natural successor of Pepper's "System" that indicated so important an epoch twenty-five years ago. By his wide learning, his unusual familiarity with the most recent contributions to medicine, and his personal acquaintance with medical workers and writers, Doctor Osler is logically the man to conduct such an enterprise. Doctor McCrae has shown in many ways his fitness to assist. A glance at the names in the two volumes before us and at the prospectus shows that the contributions are chiefly from the hands of the younger men in the profession, though all of them have made their names known as careful investigators, and many are favorably known as accurate and forcible writers. We must admit that the title seems unfortunately chosen. It seems parochial and Philistine to give the term "modern" to an enterprise that by its very existence ridicules the term. It is impossible to give a detailed account of the contents of the two volumes before us. Suffice it to point out the main features.

Volume I begins with an introductory article on "The Evolution of Internal Medicine," by Doctor Osler. In characteristic style he gives us a bird's-eye view of the development of medical science and practice, and a keen and sympathetic description of some of the characteristics of those things at the present time. As in so many of his general articles on medical study and practice, Doctor Osler lays bare the most important things in medical teaching and the most essential elements of success in medical life. It is to be hoped that this section will be carefully read not only by all medical students, but by teachers in high schools, colleges, and universities, hospital trustees and philanthropists. Doctor Adami contributes a chapter on "Inheritance and Disease" in his usual philosophic and interesting manner. The first section in the classification of diseases includes articles on "Light, *X*-rays, Electricity, Air, Heat and Cold" by Alfred Gordon. Doctor David L. Edsall has the next section, "Diseases Caused by Chemical Agents," namely, "Chronic Lead Poisoning," Chronic Arsenic Poisoning," "Poisoning by Mercury, Phosphorus, Carbon Monoxide, Illuminating Gas, Combustion Products, and Carbon Bisulphide." The reason for separating these diseases from others caused by organic agents is not so very clear when we find among the latter agents alcohol, opium, morphin and cocain. These are well treated by Doctor Alexander Lambert. "Foor Poisons" are discussed by Doctor Frederick G. Novy; "Snake Venoms" by Hideyo Noguchi. "Autointoxications" are described in an authoritative manner by Alonzo Englebert Taylor, who also contributes the chapter on "Autointoxications Associated with Protein, Purin, Carbohydrate and Fat Metabolism." James Homer Wright contributes the chapter on "Diseases Due to Vegetable Parasites Other than Bacteria," including "Actinomycosis, Nocardiosis, Mycetoma, Oidiomycosis, Blastomycosis, Pulmonary Aspergillosis and Mycosis Mucorina." Doctor Gary N. Calkins writes on "The Protozoa"; Doctor L. O. Howard on "Mosquitoes"; Doctor Charles F. Craig, "The Malarial Fevers"; Doctor J. W. W. Stephens, "Black-water Fever"; Doctor David Bruce, "Trypanosomiasis"; Doctor Richard Strong, "Amebic Dysentery"; Doctor Charles Wardell Stiles has the chapters on "Diseases Caused by Animal Parasites." It is unfortunate that this important chapter has not a stronger clinical leaning. Doctor Russell H. Chittenden and Lafayette B. Mendel contribute the chapter on "Nutrition." The first volume closes with "Constitutional Diseases," namely, "Diabetes Mellitus and Insipidus," by Doctor Thomas B. Futcher; "Gout" by the same; "Obesity" by Doctor James M. Anders; "Rickets" by Doctor George Frederic Still, and "Scurvy" by Doctor Robert Hutchison.

Volume II is devoted to "Infectious Diseases," beginning with an "Introduction" by Doctor Ludvig Hektoen. In this, such matters as infection, mixed and secondary infection, natural resistance and bacterial virulence, immunity and serum therapy and opsonins are described in such a way as to be of great value to the student or practitioner. Doctor McCrae has the chapter on "Typhoid Fever." This covers one hundred forty pages, and is one of the most complete and original articles on this important subject in many respects. The extensive experience of the Johns Hopkins Hospital is thoroughly utilized, so that the chapter becomes a remarkable record of clinical and anatomical investigation and rational therapeutics. Doctor McCrae also writes on "Typhus and Relapsing Fevers." The chapter on "Smallpox" is by Doctor William T. Councilman, and is particularly full on the pathologic side. The article on "Vaccination" is by Doctor George Dock; that on "Chickenpox" by Doctor Councilman. Doctor John H. McCollom describes "Scarlet Fever" in his authoritative way. Doctor John Ruhräh describes "Measles, Rubella, The Fourth Disease and Erythema Infectiosum." Doctor McCollom has the section on "Diphtheria"; Doctor Ruhräh those on "Whooping Cough" and "Mumps"; Doctor Frederick T. Lord describes "Influenza"; Doctor Thomas D. Coleman, "Dengue"; Henry Koplik, "Epidemic Meningitis." This includes posterior basic meningitis. Doctor James M. Anders describes "Erysipelas"; Doctors John H. Musser and George William Norris, "Pneumonia." This important chapter covers one hundred ten pages. It is very exhaustive in its analysis of recorded cases. Doctor Richard M. Pearce describes "Toxemia, Septicemia and Pyemia"; Doctor Frederick J. Poynton, "Acute Rheumatism"; Doctor W. P. Dunbar, "Asiatic Cholera"; Doctor James Carroll, "Yellow Fever"; Doctor W. J. Calvert, "Plague," and Doctor K. Shiga "Bacillary Dysentery."

From this summary it must be evident that the "System" will be an epoch-making one and that every physician must use it to a greater or less extent. For this reason it is unfortunate that so heavy a paper was used. The surface of the paper is not so destructive to the vision as that we find in many text-books and the print is clear, but the volumes are so bulky and heavy that they make continuous reading partake of many of the features of physical exercise. In this respect it contrasts strongly with Allbutt's "System." The book is illustrated with many charts, halftones, and plates in colors. Not all of these are as good as might be expected; nor is it easy to see why in some chapters illustrations have been omitted or why some others have been inserted, for example, plate 9, illustrating "the kidney worm of man from a specimen in a dog" does not seem necessary. More pains taken with Doctor Councilman's smallpox parasites would have seemed preferable. Pictures of syringes and tracheotomy tubes should not be necessary for the readers of such a work. In the second volume a literary flavor is added by apt quotations at the headings of some of the chapters, various authors from Varro to Flexner being quoted. It is difficult to see the advantage of subdividing such diseases as typhoid fever and pneumonia into chapters. The reader is struck by a lack of references to literature, amounting in some cases to a complete absence. Perhaps this is a reaction from the long bibliographic lists sometimes published, which serve no purpose but to indicate that the author has had access to an index. But there is a golden mean which gives the reader a key to the source of important statements or exhaustive articles on certain details. The proof-reading leaves a good deal to be desired; proper names are often badly neglected. But these are trifling errors and do not lessen the great value of the work as a guide to the study and practice of medicine at the present time.

*Its Theory and Practice, in Original Contributions, by American and Foreign Authors. Edited by William Osler, M. D., Regius Professor of Medicine in Oxford University; assisted by Thomas McCrae, M. D., Associate Professor of Medicine and Clinical Therapeutics in the Johns Hopkins University. Volumes I and II. Philadelphia and New York: Lea Brothers & Company, 1907.

INTERNATIONAL CLINICS.*

THE first volume of this well-known series issued by Doctor Longcope shows that he has been able to keep up the high standard set by his predecessor, Doctor Kelly. The present volume has the usual number of articles on various topics, and all are distinct additions to practical medicine. Special attention may be called to the article by Doctor Barker "On the Psychic Treatment of Some of the Functional Neuroses;" "The Treatment of Functional Heart Disease," by Doctor James J. Walsh; "The Clinical Diagnosis of Enlargement of the Thymus," by Doctor Warthin; "The Functional Capacity of the Heart," by Doctor George Wm. Norris; "Exhaustion and Toxemia as Underlying Factors in the Production of Neurasthenia, Hysteria and Delirium," by Theodore Diller; "Three Surgical Clinics," by Doctors Frederic S. Dennis, Charles A. Morton and Nicholas Senn; "On the Opening of the Pleural Cavity Without Pneumothorax," by Doctor Tuffier; "Disorders of the Umbilicus, with Special Reference to the Newborn and the Infant, and Umbilical Infections," by Doctor A. Ernest Gallant; "Intraocular Angiosclerosis and Its Prognostic and Diagnostic Significance," by Doctor George E. De Schweinitz; "Hysterical Mutism," by Doctor G. Hudson-Makuen; three excellent "Progress" articles—on Treatment, by A. A. Stevens; Medicine, by David L. Edsall and Verner Nisbet; and Surgery, by Joseph C. Bloodgood. The series is evidently destined, like its predecessors, to be of great use to the profession. G. D.

*A Quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles, et cetera. Edited by W. T. Longcope. Seventeenth series. Volume I, 1907. J. B. Lippincott Company, Philadelphia and London.

A TEXT-BOOK ON THE PRACTICE OF MEDICINE FOR STUDENTS AND PRACTITIONERS.*

As the first edition of this work was exhaustively reviewed in The Physician and Surgeon it is not necessary at this time to do more than call attention to the second edition. The revision seems to have been thorough and painstaking. As before, the text is characterized by the clearness of its statements. The difficulties of classification have not been entirely avoided, and the placing of animal parasites after intoxications leads to the anomaly of considering amebic dysentery with infectious diseases and malarial fever in the other chapter.

The sections on treatment are as usual clear and show a familiarity with the latest preparations, as a general thing. Attention may be called to a few details. In the consideration of the tubbing treatment of typhoid fever the time-honored recommendation to give whiskey is repeated. Many therapeutists at the present time get along very well without whiskey, and, in fact, think the patients are better off by the omission. In the treatment of tympanites in typhoid fever the recent recommendation of eserine is not mentioned. In vaccinating the septic and crude method of scarification is given. Perhaps the volume was revised before Flexner's serum for cerebrospinal meningitis was widely known. The treatment for pleurisy with effusion is good for cases first seen when the effusion is well established. It would be worth while for the practitioner to realize that very often tapping may be avoided without any loss, either by the spontaneous absorption of an effusion or by absorption following the use of drugs given for the relief of certain symptoms, such as pain and fever. We mean, of course, the salicylates. Through a curious error in the text regarding tapping, page 442, it is said, "Experienced clinicians have frequently been infected by a dry tap when they were skillful enough to diagnose an effusion but careless enough not to notice that their needle was plugged." Some reference to cardiolysis in pericardial adhesions would seem to be timely. On the whole, the book will form a useful and interesting guide to the student or practitioner. The illustrations are good; the mechanical execution of the work in general excellent.

G. D.

*By Hobart Amory Hare, Professor of Therapeutics in the Jefferson Medical College of Philadelphia, et cetera. Second edition, revised and enlarged. Lea Brothers & Company, Philadelphia and New York.

A CATALOGUE OF MEDICAL AND SURGICAL BOOKS.

So great has been the demand, that W. B. Saunders Company, the medical publishers of Philadelphia and London, have found it necessary to issue another revised edition of their illustrated catalogue of medical and surgical books. In looking through the copy we have received, we find that since the issuance of the last edition six months ago, the publishers have placed on the market some twenty-five new books and new editions—truly an indication of publishing activity. The colored insert plate from "Keen's New Surgery," which enhanced the value of the former edition, has been replaced by a new one from the second volume of the same work, and this alone gives the catalogue a real value. A copy will be sent to any physician upon request.

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ORIGINAL ARTICLES.

MEMOIRS.

OPSONIC WORK AT ANN ARBOR.

OBSERVATIONS ON PHAGOCYTOSIS IN RELATION TO THE OPSONIC INDEX.*

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WHILE the phenomenon of phagocytosis of bacteria has been known and studied for a considerable time, it is only within the past few years that some of the causes and the laws governing the action have become better understood.

The best known cause of phagocytosis at present, and the one occupying the attention of medical men almost exclusively, is the opsonin of the blood serum, first clearly demonstrated by Wright and Douglas.

Of the several protective bodies known to exist in normal and immune sera, only the opsonins can be quantitatively determined with any considerable degree of accuracy by any methods so far discovered.

It should be remembered, however, that all the immune protective bodies arise from the action of the bacteria and their chemical products; so that, while the opsonins are distinct from the others, the probable quantity of the others may at least be inferred from the amount of opsonin found to be present.

In order that phagocytosis may indicate the relative quantities of an opsonin in two sera, special technical methods must be employed and certain principles followed. Lack of knowledge of the principles governing phagocytosis causes more inconsistent and erroneous opsonic

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findings than failure to follow the technical rules so frequently published by various workers.

It is the purpose of this paper to describe some experiments which may throw some light on such errors.

Staphylococci of various strains were used in all the experiments.

In the method of technic used by those who follow Wright, and this includes all workers excepting those who use Simons' method, equal proportions of pure blood serum, washed leucocytes and a suspension of staphylococcus in normal salt are intimately mixed and incubated for a definite time—usually fifteen to thirty minutes.

Now every one knows how difficult it is to maintain the virulence of a strain of staphylococcus; and it must be common knowledge to all workers with opsonins that the opsonin normally present in blood serum is sufficient to sensitize such a large number of ordinarily virulent staphylococci that in the usual Wright preparation the phagocytosis would be far too great for accurate or convenient counting.

In order to reduce the phagocytic index to an average that can be readily and quickly counted, the method generally employed is to dilute the bacterial suspension to the degree required, as shown by experience.

I shall try to show that such a method will not and cannot give any true indication of the relative opsonic value of the sera tested.

Essential processes in phagocytosis are:

(1) The sensitization of the bacteria, and

(2) The phagocytosis of the bacteria so sensitized and only those.

The first process, of course, must precede the second.

The rate of sensitization will be, presumably, proportional to the quantities of opsonin in the sera used. If this rate be slow, extending over the incubation interval of fifteen to thirty minutes, then, even with a thin suspension of bacteria, we might expect phagocytic indices proportional to the opsonin in the sera. On the other hand, if sensitization be a rapid process, completed with the first few moments of the incubation period, leaving a considerable interval without fresh addition of sensitized bacteria, phagocytosis following quickly on preparation should, if all the bacteria introduced are sensitized by each serum, give equal indices. If too few bacteria are present to satisfy all the opsonin of the stronger serum, the weaker one being satisfied, errors of all degrees should be possible.

It is then important to know something of the time needed for the completion of the reaction of sensitization. To investigate this, a mixture of dense staphylococcus suspension in normal salt with an equal quantity of a normal serum (both at 37° centigrade) was made and incubated. At intervals of one, three, five, ten, fifteen, and twenty minutes after making the mixture, double portions of it were withdrawn, mixed with single portions of washed leucocytes, and incubated for thirty minutes. The results are shown in Table I.

It appears from this experiment that the process of sensitization is very early completed. It follows, then, that if the bacterial suspension contains fewer germs than the opsonin of either serum is able to sensitize, the result should be that each will sensitize all the bacteria present, and equal phagocytic indices will be observed. In such a case the opsonic index obtained will be unity regardless of the real difference between the sera. If all the opsonin of the weaker serum find bacterial attachment, but too few bacteria are introduced to combine with all the opsonin in the stronger serum, an error depending on the quantity of opsonin not combined will result.

TABLE I.

Intervals after Mixing Serum and Bacteria	1.	3.	5.	10.	15.	20.
Average phagocytosis....................	10.30	10.28	10.38	10.14	10.15	10.35

That these deductions are true is shown by the following experiment:

Seven bacterial suspensions having their densities in the proportion of one, two, four, eight, sixteen, twenty-four, and thirty-two were prepared. Two sera, one twice the strength of the other, were made by appropriately diluting a serum with normal salt solution.

Using the weaker serum as a normal, the opsonic index of the stronger was obtained by using each of the seven bacterial suspensions.

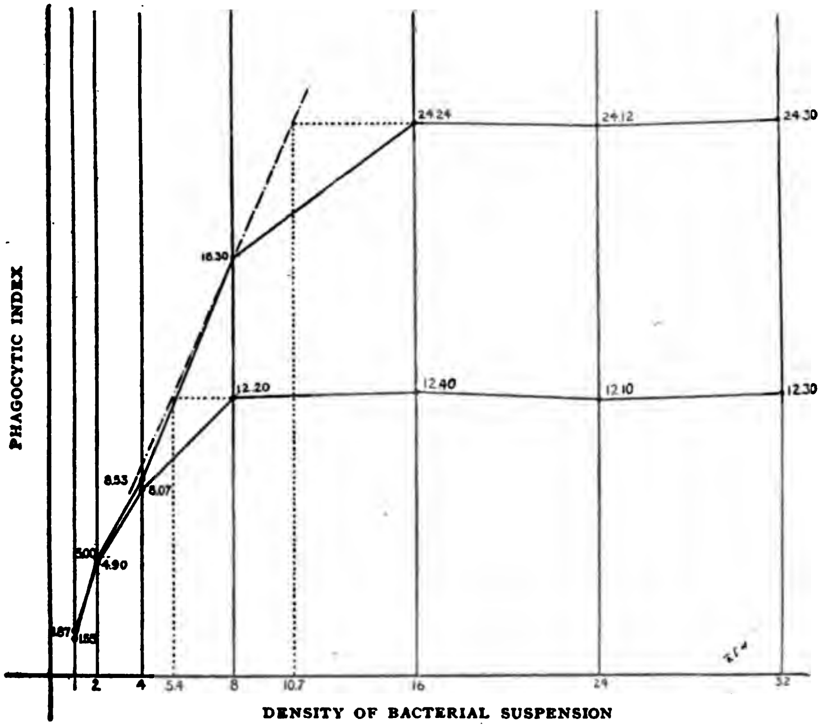
The results are shown in Table II:

TABLE II.

Relative Density of Bacterial Suspension	1.	2.	4.	8.	16.	24.	32.
Phagocytic Index for Serum No. I...	1.87	4.90	8.07	12.20	12.40	12.10	12.30
Phagocytic Index for Serum No. II..	1.55	5.00	8.53	18.30	24.24	24.12	24.30
Opsonic Index for Serum No. II....	.83	1.02	1.05	1.5	1.95	1.99	1.98

These results plotted as curves, haying the density of bacterial suspension and the phagocytic index as ordinates and abcissæ, show some very interesting points.

For each serum the phagocytic index advances nearly in the same proportions as the numbers of bacteria used, up to a certain point. For the weaker serum this proportion is lost after the third suspension, the index for the fourth being only 12.20 instead of about sixteen. This means that the serum could sensitize only enough bacteria of those present in the fourth suspension to produce under the circumstances of the experiment a phagocytosis of 12.20. Two, three, and four times the number of bacteria used in the fourth suspension gave practically the same phagocytic index for the serum. Under the circumstances of the experiment the weaker serum was able to produce a maximum phagocytic index of 12.20. Excess of bacteria, above what were needed for this result, had no effect because the excess could not be sensitized by the serum and only sensitized bacteria are taken up.



By extending the general line of the curve for the first three points, until it intersects the phagocytic line of 12.20, we obtain as the density of bacterial suspension just sufficient to satisfy all the opsonin in the weaker serum, that density which corresponds to 5.4 times the thinnest suspension used.

Examining the curve for the stronger serum in the same manner, it is seen that its maximum phagocytic index is not reached until the fifth bacterial suspension was used. Double and treble the number of bacteria in the suspension did not increase this maximum index of 24.24.

The density of bacterial suspension just sufficient to produce an index of 24.24 for the stronger serum is found to correspond to 10.7 times the density of the thinnest suspension used in the experiment; and this is just about double the corresponding suspension for the weaker serum, namely: 5.4.

It is apparent that any density of bacterial suspension less than 10.7

times the minimum suspension used must yield an erroneous opsonic index; and that this error may vary anywhere between 1 and the true index of 2.

In the experiment just described the two sera corresponded closely to normal serum diluted fifteen and thirty times respectively.

The thinnest bacterial suspension contained about 1,000,000 cocci per cubic millimeter.

Undiluted serum would require about fifteen times as dense a suspension as the one just sufficient to produce the maximum phagocytic index of 24.24 in the curve, and would allow an average of 363.6 cocci per leucocyte, supposing that the cell would engulf that many.

It must be clear, then, that unless one has a strain of staphylococcus of exceptional virulence the use of undiluted serum is impracticable.

A method of technic based on the work described, and which has given good results, is to dilute the serum ten to twenty-five times in one of the tubes described by Wright for making higher dilution at a single step, and to use the diluted serum with a very opaque suspension of staphylococci.

It seems scarcely necessary to add that the principle of using enough bacteria to produce the maximum phagocytosis of which the serum is capable applies to all bacteria which are rapidly sensitized.

However, for species for which but little opsonin exists in the blood, as for example the typhoid bacillus, comparatively fewer germs are necessary and the serum need not be diluted.

No harm will follow the use of thick bacterial suspensions in such work, and errors may thus be avoided.

[In concluding this paper I desire to express my thanks to Doctor George Dock and the members of his hospital staff for the encouragement and valuable suggestions and criticism, without which my observations could scarcely have been carried out.]

ON THE REACTIVATION OF HEATED NORMAL HUMAN OPSONIC SERUM WITH FRESH DILUTED SERUM: A CONTRIBUTION TO THE STUDY OF THE STRUCTURE OF OPSONINS.*

A PRELIMINARY REPORT.

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AND
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SINCE the work of Wright and Douglas much discussion has arisen as to the nature and composition of the so-called "opsonins." The views that are generally held may be conveniently classified as follows:

(1) Opsonins are identical with certain other antibodies.

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*Reproduced from *The Journal of Medical Research,* October, 1907.

(2) Opsonins are not identical with any of the other antibodies, but have a structure, according to Ehrlich's theory, similar to certain of the constituents of normal or immune serum already known.

a.—This is a simple structure like that of the toxins, agglutinins, precipitins, complements, et cetera.

b.—This is a double structure like that of the cytotoxins, or the hemolysins of hemolytic sera, in that it requires the combined action of a thermostable substance, amboceptor, and a thermolabile substance, complement, to produce its effects.

(3) Opsonins are unlike any of the other antibodies and form a class by themselves.

Adopting and modifying the method of Leishmann, Wright and Douglas[1] found that there are in normal sera of man and the lower animals thermolabile substances without which phagocytosis cannot take place, and they seem to have considered them different from other antibodies. Bulloch and Atkin[2] confirmed the work of Wright and Douglas and came to the conclusion that the action of heat did not convert the opsonin into an inactive modification, but destroyed it completely. Neufeld and Rimpeau,[3] Dean,[4] Muir and Martin,[5] and others have observed, especially in immune serum and to a much less extent in normal serum, the presence of opsonin which is not wholly destroyed by heat. Dean[4] came to the conclusion, first, that the thermostable residuum in heated normal serum is identical with the thermostable opsonin of immune serum, and, second, that both are the same as the amboceptor, immune body, or fixateur. Keith,[6] working on the "Relationship between Hemolysis and the Phagocytosis of Red Blood Cells," was led to believe that "the phagocytosis of red blood cells does not depend upon the presence of the hemolytic amboceptor," but that "the phenomenon is caused by some special body belonging to the class of opsonins." Hektoen and Ruediger[7] observed that if streptococci "once sensitized are exposed for thirty minutes to the temperature at which the serum used for sensitization is inactivated, or preferably three or four degrees higher; cocci are not taken up to any extent either by washed leukocytes or by leukocytes in defibrinated blood." From this they argued that "evidently the substance, opsonin, taken up from the sera by the receptors of the cocci becomes changed in such a manner that it not only no longer renders the cocci fit for phagocytosis, but actually prevents the cocci from taking up new opsonin," and conclude that "it appears that opsonins, like toxins and complements, possess two groups of molecules, one haptophore, whereby it attaches itself to the bacterial receptors, and one which may be called the opsoniferous group, whereby is effected in the bacteria some change, physical or chemical, that is necessary for phagocytosis. We may say that when sensitized cocci are heated the opsoniferous group is largely inactivated, but as the bacterial receptors remain occupied by the haptophore group, bacteria are prevented from taking up new opsonin. In accordance with

Ehrlich's nomenclature opsonin, the opsoniferous group of which is destroyed or inactivated, may be termed opsonoid. So far we have not obtained indications that any amboceptor is concerned in the sensitization of bacteria for phagocytosis by leukocytes of normal animals." In a later work Hektoen[8] concludes that "the opsonic function of normal and immune serum is due to a distinct body for which opsonin is an apposite and convenient name."

Muir and Martin[5] in their work on the absorption of opsonin from normal and immune sera by the combination of receptor plus immune body (amboceptor) conclude:

"(1) The thermolabile opsonin of a normal serum and the thermostable opsonin of an immune serum are two distinct classes of substances. In addition to differing markedly as regards their resistance to heat, they differ in their combining relationships.

"(2) The thermostable opsonin of the antiserum investigated is a true antisubstance, and possesses the comparatively specific character of antisubstances in general; it is left undetermined whether it has the constitution of an agglutinin or of an immune body, though certain facts point in favor of the former."

It has seemed to us very remarkable that, considering the variety of views held as indicated above, it has occurred to no one, as far as we are aware, to apply Bordet's classical experiment on the reactivation of heated bacteriolytic serum to the study of opsonins. Bordet found, in brief, that the serum of an animal immunized against the cholera vibrio loses its bacteriolytic property on heating at 55° to 60° centigrade for a few minutes, and that this property may be restored by the addition of a comparatively small amount of unheated serum, whether bacteriolytic or not. This observation of Bordet has been repeatedly confirmed and extended in its application to a wide variety of bacteriolytic sera, hemolysins, and the like.

The generally accepted interpretation of this phenomenon has been on the line of Ehrlich's theory, namely, that the process of immunization brings about the production in the blood of a thermostable substance variously known as amboceptor, immune body, or fixateur. This amboceptor requires for its complete activity the presence of a thermolabile* substance usually spoken of as the complement. This latter body seems to exist in comparatively large amount in all normal and immune sera.

With this knowledge in mind we began the following investigation. Considering the numerous factors of error in a work of this kind it has seemed to us very important that each worker should give as full and detailed an account of his technic as possible in order that others may be better able to judge the soundness of his conclusions. Accordingly we offer no further apologies for presenting our method here.

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*This is a general statement. Ehrlich and Morganroth (as well as others) have shown that some complements are distinctly thermostable. Collected studies on immunity. Paul Ehrlich, English edition, 1906. John Wiley & Sons, New York and London, page 13.

METHOD OF OUR INVESTIGATION.

Serum.—Blood from the finger is collected in Wright tubes with bent capillary arm, allowed to clot, sealed in the flame, and centrifugalized. This is what we designate as normal serum. Heated serums are made by immersing a tube of normal serum in a water bath at the desired temperature. The thermometer bulb is placed at the side of the serum tube and carefully watched during the heating period, which in all cases lasted ten minutes. The serum is then removed and allowed to cool at room temperature. Diluted serums are made by adding enough volumes of .85 per cent salt solution to one volume of normal serum to bring them to the desired dilution. Dilutions higher than one-tenth are formed by first making a low dilution and rediluting this to the desired point with a new pipet.

Corpuscles.—Twenty or thirty drops of blood are allowed to fall from the finger into a centrifuge tube holding fifteen cubic centimeters of citrate solution (sodium chloride .85 per cent and sodium citrate one per cent in distilled water). This tube and its mate are balanced on the laboratory scales to make the machine run smoothly and centrifugalized at high speed for twenty minutes. The supernatant citrate solution is then replaced with salt solution (.85 per cent NaCl). The corpuscles are thoroughly stirred with a coarse calibered pipet to remove any serum which may adhere to them and again centrifugalized for the same length of time. The salt solution is removed and the entire sediment, reds and whites, carefully brought to a homogeneous mixture. The stock citrate solution was put up in separate tubes holding about twenty cubic centimeters and autoclaved, to avoid the annoyance of having the citrate solution contaminated by bacterial growth.

Bacterial Suspensions.—Agar cultures of the Staphylococcus albus are incubated at 37° centigrade for about twenty-four hours, and then kept in the dark at room temperature. One-third to one-half of such a culture is removed with a platinum loop and stirred with a few drops of salt solution in a small glass mortar to a thick suspension. This is diluted to about .5 cubic centimeter, placed in a mixing tube and centrifugalized five or ten minutes, the supernatant suspension is transferred to another mixing tube, still further diluted, if thought necessary, to keep the counts from being too large, and well mixed. In most of these experiments the cultures were from one to two days old, but in Experiments 10 and 11 the cultures were eleven and twelve days old. We have never observed that the age of the cultures up to twelve days makes any difference whatsoever.

Phagocytic Mixtures.—We prefer phagocytic tubes with a capillary of about fifteen centimeters long and an internal diameter of .8 to .9 millimeter. We make up a large number of tubes at one time and sort them with the eye into bunches of nearly the same length and caliber. If the tubes are too fine in caliber the leukocytes are liable to show degenerative changes due to friction against glass. Tubes of larger caliber vary more in size, and, we think, in the time they take to reach the incubator temperature. Each tube is marked with a fine line in ink (in preference to the wax pencil) one and one-quarter inches from the tip to measure equal volumes of the different fluids. The corpuscles, serum, bacterial suspension, et cetera, are then drawn up in equal volumes as indicated, and mixed carefully in a small mixing tube, withdrawn into the same phagocytic tube, its tips sealed in the flame, and the tube placed in the cement incubator.

CEMENT INCUBATOR.—This incubator was designed to furnish a number of air chambers of uniform and constant temperature at a minimum cost. It consists of a rectangular block of cement measuring nine and three-quarter inches by nine and one-quarter inches by five inches in which are imbedded twenty-four glass tubes nine inches long with an internal diameter of one-half inch. The tubes lie horizontally in three rows of eight tubes each, separated from each other by a space of one-half inch of cement. Each tube is closed behind with a bit of cork, and a thin layer of cement, and in front with a cork through which passes a short string to facilitate its removal. The whole sets inside an ordinary copper incubator with a water jacket and is kept at 37° centigrade.

SPREADS AND STAINS.—The phagocytic mixtures are incubated fifteen minutes and then removed, and a small drop from near the center of the tube allowed to run on a clean coverslip and a second coverslip placed over it. The two are then drawn apart as in making ordinary blood spreads, dried in the air and stained by Wright's (Harvard) method. We make four to six spreads of each phagocytic mixture and select the best. The spreads are mounted in balsam and examined in oil. Fifty polymorphonuclear neutrophiles are counted in each preparation.

FACTORS OF ERROR.—The reduction in the size and number of experimental errors depends much on the operator's skill and experience, and his careful attention to details. The constant aim is to have all phagocytic mixtures subjected to the same conditions from the beginning to the end of the experiment, so that all the circumstances will be alike save for the one variation introduced for experimental purposes. The most important of these errors comes, we believe, in the matter of making the spreads, stains, and counts.

A good spread should be uniform in thickness, the leukocytes numerous and well flattened out. They should not be clumped together, should show no evidences of degeneration, and should not be crowded with red cells or bacteria about their edges. To this end the coverslips must be absolutely clean, and flamed shortly before using. The drop of blood should be of such a size that the coverslips stick just the least bit when drawn apart. Other points depend upon having the proper proportions of corpuscles and bacteria in the phagocytic mixtures.

In the use of Wright's stain the point to be observed is to slightly overstain and decolorize with distilled water. During the process of decolorization the specimen is examined under the low power until the nuclei of the leukocytes are clearly defined and appear a light blue color. Under the oil immersion the bacteria should stand out sharply against the nuclei as well as in the cytoplasm. If the cells have been well flattened out it will not be necessary to focus up and down to count all the bacteria in them. If the stains and spreads are good the counts of different observers will not vary any more than the repeated counts of one observer on the same preparation, provided the counts are not too high. In the case of counts of thirty-five or over, the individual equation probably plays a considerable part. It is, however, possible to count, with considerable accuracy, cells containing fifty to fifty-five staphylococci. In this respect the cocci offer an advantage over bacilli for experimental purposes. With counts under two our experiments show a high degree of experimental variation.

The number of cells necessary to count in order to obtain an accurate result is uncertain. With some preparations a second count of twenty-five cells will agree very closely with the first twenty-five, or the second fifty with the first fifty, while in other preparations, which appear to be equally good, there may be quite a marked difference. This is to be expected when one considers the variation in count of the individual leukocytes themselves.

We wash our leukocytes only twice. The amount of spontaneous phagocytosis, while quite variable, as can be seen, was never over 1.68 and only averaged .71 in nine successive experiments. How much of the apparent phagocytosis is due to bacteria which have fallen on the leukocytes instead of being taken up by them is open to question. We are confident that a large proportion of the cocci which would naturally drop on the leukocytes fall off again before the spreads dry, because the spontaneous phagocytosis is frequently less than it otherwise would be if the bacteria were as numerous on the leukocytes as they are in other parts of the field.

To reduce the possible error from subjectivity in counting we mark each slide with a number in ink and cover it with a plain label so that the number is only visible by holding the slide to the light. The slides are then mixed and counted at random. We save all our slides, which may be seen at any time.

The serum and corpuscles both come from the same person (W. S. C.) unless otherwise mentioned.

Experiments.—The first three experiments are given in full to demonstrate the method employed in making up the phagocytic mixtures. As the first two experiments were designed simply to satisfy ourselves as to whether reactivation would take place or not, they lack a few of the controls which were afterwards added, the most important we consider to be the spontaneous phagocytosis given in the absence of serum.

EXPERIMENT I.—MAY 23, 1907.

		Volumes.	Phagocytic count.
(1)	Corpuscles	1	
	Unheated serum	1	
	Staphylococcus suspension	1	
	Salt solution	1	19.26
(2)	Corpuscles	1	
	Heated serum 60° centigrade	1	
	Staphylococcus suspension	1	
	Salt solution	1	3.38
(3)	Corpuscles	1	
	Diluted serum 1/10	1	
	Staphylococcus suspension	1	
	Salt solution	1	8.72
(4)	Corpuscles	1	
	Heated serum 60° centigrade	1	
	Diluted serum 1/10	1	
	Staphylococcus suspension	1	21.76

It will be observed that this experiment shows each phagocytic mixture to contain the same number of leukocytes and bacteria per cubic centimeter provided the suspensions were perfectly uniform.

EXPERIMENT II.—MAY 24, 1907.

		Volumes.	Phagocytic count.
(1)	Corpuscles	2	
	Unheated serum	1	
	Staphylococcus suspension	1	
	Salt solution	1	16.92
(2)	Corpuscles	2	
	Heated serum 60° centigrade	1	
	Staphylococcus suspension	1	
	Salt solution	1	0.96
(3)	Corpuscles	2	
	Diluted serum 1/10	1	
	Staphylococcus suspension	1	
	Salt solution	1	7.24
(4)	Corpuscles	2	
	Diluted serum 1/20	1	
	Staphylococcus suspension	1	
	Salt solution	1	2.30
(5)	Corpuscles	2	
	Heated serum 60° centigrade	1	
	Diluted serum 1/10	1	
	Staphylococcus suspension	1	11.32

		Volumes.	Phagocytic count.
(6)	Corpuscles	2	
	Heated serum 60° centigrade	1	
	Diluted serum 1/20	1	
	Staphylococcus suspension	1	11.38

Experiment III.—May 26, 1907.

		Volumes.	Phagocytic count.
(1)	Corpuscles	2	
	Unheated serum	1	
	Staphylococcus suspension	1	
	Salt solution	1	28.72
(2)	Corpuscles	2	
	Staphylococcus suspension	1	
	Salt solution	2	1.68
(3)	Corpuscles	2	
	Heated serum 60° centigrade	1	
	Staphylococcus suspension	1	
	Salt solution	1	1.70
(4)	Corpuscles	2	
	Diluted serum 1/25	1	
	Staphylococcus suspension	1	
	Salt solution	1	2.10
(5)	Corpuscles	2	
	Diluted serum 1/50	1	
	Staphylococcus suspension	1	
	Salt solution	1	2.52
(6)	Corpuscles	2	
	Heated serum 60° centigrade	1	
	Diluted serum 1/25	1	
	Staphylococcus suspension	1	6.22
(7)	Corpuscles	2	
	Heated serum 60° centigrade	1	
	Diluted serum 1/50	1	
	Staphylococcus suspension	1	3.50
(8)	Corpuscles	2	
	Normal guinea-pig serum	1	
	Staphylococcus suspension	1	
	Salt solution	1	16.86
(9)	Corpuscles	2	
	Diluted guinea-pig serum 1/25	1	
	Staphylococcus suspension	1	
	Salt solution	1	1.56
(10)	Corpuscles	2	
	Heated human serum 60° centigrade	1	
	Diluted guinea-pig serum 1/25	1	
	Staphylococcus suspension	1	5.74

It seems probable from this experiment that the serum of the guinea-pig is also capable of reactivating a heated normal serum for the phagocytosis of the staphylococcus albus. The small amount of reactivation shown as compared with the other experiment is very likely due in part to the high dilution, and also to the fact that the guinea-pig serum did not cause as great a phagocytosis as human serum, and so may not have contained as much of the reactivating substance. Further experiments are necessary to determine this point.

For the sake of brevity and ease of comparison we omit in the succeeding experiments such details as the number of volumes of corpuscles, staphylococcus suspension, and salt solution which go to make up each phagocytic mixture, inasmuch as they are all made in the same manner as Experiments II and III.

EXPERIMENT IV.—MAY 27, 1907.

		Phagocytic count.
(1)	Unheated serum	12.26
(2)	Salt solution	0.28
(3)	Heated serum 50° centigrade	8.80
(4)	Heated serum 55° centigrade	0.76
(5)	Heated serum 60° centigrade	0.66
(6)	Diluted serum 1/15	1.32
(7)	Heated serum 50° centigrade plus diluted serum 1/15	11.86
(8)	Heated serum 55° centigrade plus diluted serum 1/15	11.76
(9)	Heated serum 60° centigrade plus diluted serum 1/15	6.72
(10)	Unheated serum plus diluted serum 1/15	12.30

EXPERIMENT V.—MAY 28, 1907.

(1)	Unheated serum	33.86
(2)	Salt solution	1.26
(3)	Heated serum 57° centigrade	3.24
(4)	Diluted serum 1/15	5.50
(5)	Heated serum 57° centigrade plus diluted serum 1/15	23.06
(6)	Unheated serum plus diluted serum 1/15	27.88

EXPERIMENT VI.—MAY 29, 1907.

(1)	Unheated serum	11.70
(2)	Salt solution	0.46
(3)	Heated serum 55° centigrade	0.62
(4)	Heated serum 60° centigrade	0.28
(5)	Diluted serum 1/15	4.22
(6)	Heated serum 55° centigrade plus diluted serum 1/15	10.36
(7)	Heated serum 60° centigrade plus diluted serum 1/15	11.16
(8)	Heated serum 60° centigrade plus heated serum 55° centigrade	0.58
(9)	Unheated serum plus diluted serum 1/15	12.74

EXPERIMENT VII.—MAY 30, 1907.

	Phagocytic count.
(1) Unheated serum	11.94
(2) Salt solution	0.38
(3) Heated serum 50° centigrade	14.64
(4) Heated serum 60° centigrade	0.32
(5) Diluted serum 1/15	6.76
(6) Heated serum 50° centigrade plus diluted serum 1/15	15.84
(7) Heated serum 60° centigrade plus diluted serum 1/15	9.22
(8) Heated serum 60° centigrade plus heated serum 50° centigrade	17.00

EXPERIMENT VIII.—MAY 31, 1907.

(1) Unheated serum	23.42
(2) Salt solution	0.86
(3) Heated serum 60° centigrade	0.40
(4) Heated serum 64° centigrade	0.50
(5) Heated serum 65° centigrade	0.94
(6) Diluted serum 1/15	6.28
(7) Heated serum 60° centigrade plus diluted serum 1/15	16.72
(8) Heated serum 64° centigrade plus diluted serum 1/15	4.60
(9) Heated serum 65° centigrade plus diluted serum 1/15	3.24
(10) Heated serum 64° centigrade plus unheated serum	19.58
(11) Heated serum 60° centigrade plus unheated serum	19.68
(12) Unheated serum plus unheated serum	18.90

EXPERIMENT IX.—JUNE 2, 1907.

(1) Unheated serum	37.90
(2) Salt solution	1.20
(3) Heated serum 58° centigrade	0.60
(4) Heated serum 62° centigrade	1.46
(5) Diluted serum 1/20	2.60
(6) Heated serum 58° centigrade plus diluted serum 1/20	22.08
(7) Heated serum 62° centigrade plus diluted serum 1/20	11.10
(8) Heated serum 58° centigrade plus heated serum 62° centigrade	2.60

EXPERIMENT X.—JUNE 13, 1907.

(1) Unheated serum	15.44
(2) Salt solution	0.18
(3) Heated serum 57° centigrade	1.08
(4) Diluted serum 1/15	1.56
(5) Heated serum 57° centigrade plus diluted serum 1/15	12.40
(6) Unheated serum plus unheated serum	16.08

EXPERIMENT XI.—JUNE 14, 1907.

(1) Unheated serum	19.78
(2) Salt solution	0.10
(3) Heated serum 45° centigrade	17.42

	Phagocytic count.
(4) Heated serum 50° centigrade	22.38
(5) Heated serum 53° centigrade	7.92
(6) Heated serum 56° centigrade	0.60
(7) Heated serum 60° centigrade	0.44
(8) Diluted serum 1/15	1.36
(9) Heated serum 50° centigrade plus diluted serum 1/15	19.60
(10) Heated serum 53° centigrade plus diluted serum 1/15	14.68
(11) Heated serum 56° centigrade plus diluted serum 1/15	12.76
(12) Heated serum 60° centigrade plus diluted serum 1/15	16.14
(13) Heated serum 56° centigrade plus heated serum 53° centigrade	4.90
(14) Heated serum 60° centigrade plus heated serum 53° centigrade	4.84
(15) Heated serum 60° centigrade plus heated serum 50° centigrade	17.96

DISCUSSION.

The preceding experiments demonstrate for the staphylococcus albus:

(1) That the opsonic power of normal human serum is lost by heating the serum to 55° centigrade or over for ten minutes. The phagocytosis at these temperatures is practically the same as that given with salt solution. The serum begins to show signs of loss on heating at 53° centigrade for ten minutes. (One case.)

(2) That dilutions of serum to 1/15 and over give decidedly low phagocytic counts with the staphylococcus suspensions used. Serums diluted 1/15 varied between 1.32 and 6.76; serums diluted 1/20, 1/25, 1/50 varied between 2.10 and 2.60; serums diluted 1/10 gave rather high counts, 7.24 and 8.72.

(3) That the addition of serums diluted 1/10, 1/15, and 1/20 to serums heated between 55° centigrade and 60° centigrade give phagocytic counts approaching those of the unheated serum and considerably over the sum of the counts given by the heated and diluted sera alone.

(4) That serums heated above 60° centigrade are not reactivated to such an extent. The number of experiments on this point are too few to justify a definite conclusion.

(5) That dilutions of serums above 1/20 do not reactivate serum heated at 60° centigrade to such an extent as the lower dilutions. (Two experiments.)

(6) That heated human normal serum can be reactivated by the diluted serum of the lower animals. (Guinea-pig. One experiment.)

Wright and Douglas[1] seem to have considered opsonin as a somewhat simple substance which could be completely or almost completely destroyed by heating at 56° centigrade or over, and that the heated serum was to all intents and purposes as inert, as far as its possible effect upon phagocytosis was concerned, as so much salt solution.

The experiment (I) which led them to this conclusion bears a certain resemblance to our own, and as it is the only case which we have met with in our search through the literature we present it in full:

"In the experiments set forth below we mix in each case three volumes of blood fluid and one volume of a staphylococcus suspension, containing generally from 7,000 to 10,000 million staphylococci per cubic centimeter.

"The mixture of corpuscles, blood fluid, and staphylococci was kept in each case for fifteen minutes at a temperature of 37° centigrade in order to give opportunity for phagocytosis. * * *

"* * * the activity of phagocytosis falls off at the same rate when the unheated serum is diluted with salt solution as when it is diluted with heated serum.* The experiment whose results are tabulated below illustrates this point.

"Result of a comparison made between the activating power of (*a*) unheated serum diluted in heated serum, and (*b*) unheated serum diluted in physiological salt solution. In each case three volumes of serum dilutions were mixed with one volume of staphylococcus suspension and three volumes of washed corpuscles.

Dilution in which the unheated serum was employed.	Average phagocytic power of the P.W. B. C. in the case where the unheated serum was diluted with previously heated serum.	Average phagocytic power of the P.W. B. C. in the case where the unheated serum was diluted with physiological salt solution.
3. fold	—	34.2
6. "	27.4	27.2
12. "	23.1	30.5
24. "	20.6	24.8
48. "	5.0	4.95
96. "	—	0.8
192. "	—	0.6

"It is clear that we may conclude that the heated serum, like the salt solution, acts merely as an inert diluent, and we may, in referring to such heated serum, characterize it simply as 'inactivated serum.'"

To this conclusion we object for the following reasons:

(1) Wright and Douglas report only one experiment.

(2) They report no controls such as the phagocytosis with unheated serum alone, heated serum alone, and with salt solution alone; though probably this does not make much difference with their experiment.

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*Wight and Douglas heated their serum from 60° centigrade to 65° centigrade for ten to fifteen minutes.

(3) The phagocytic counts which they obtained with the unheated serum diluted with salt solution are very unusual in our opinion, in that they obtained a count of 24.8 with a serum dilution of 1/24, which is a drop of only ten from the first, or 1/3 dilution, namely, 34.2. On the other hand, the next dilution, 1/48, gave a drop of about twenty from the one before it, namely, to 4.95. Our own experience would lead us to expect a more uniform change, although it may be granted that it is not unusual for the count of one serum dilution to differ little from the count obtained with dilutions containing one-half or twice as much serum. Dilutions of 1/10 or over have never failed in our hands to effect a much greater fall in the phagocytic count. The importance of this subject in its relation to the determination of the "opsonic index" is very evident, but does not concern us here.

We have not repeated Wright and Douglas' experiment for the reason that we felt that whether our results should agree with theirs or not, they could not prove or disprove the correctness of their figures, whereas the results we have obtained, showing the power of a diluted serum to reactivate a heated serum for the phagocytosis of the staphylococcus albus, render their conclusion doubtful.

To Hektoen and Ruediger's conclusions that opsonin has the structure of toxins and complements we dissent for the following reasons:

(1) They argue by analogy that because opsonin appears to be destroyed by heat, it may have a structure similar to toxins and complements, which are also inactivated by heat. While this is true, so far as it goes, we object because opsonins might also have a structure similar to the hemolysins and bacteriolysins, which are likewise inactivated by heat, but differ from the complements in that they can be reactivated by fresh serum.

(2) They found that sensitized streptococci, if heated for a sufficient time (thirty minutes) at 60° centigrade, would not be taken up to any great extent by the phagocytes, and, moreover, that they could not be resensitized with fresh serum. From this they argued that the opsonin had combined with the bacteria and had become, through heating, what they called an inactive substance, "opsonoid," which as long as it was combined with the bacteria prevented fresh opsonin from acting on them to produce phagocytosis.

This may be true in either case, for if the opsonin has the amboceptor complement structure like hemolysins and bacteriolysins, it may be well conceived that the combination of bacteria plus opsonin would be so damaged by prolonged heating as to render the bacteria unappetizing to the leukocytes, while at the same time the bacterial receptors are completely occupied and thus the action of fresh opsonin is prevented.

(3) Hektoen and Ruediger made the observation that "digestion of cocci in serum inactivated by heat does not interfere with their phagocytosis in fresh serum."

According to their reasoning, the "opsonoid" of the heated serum should have combined with the bacteria and ought not to have permitted sensitization with fresh opsonin. On the other hand, if opsonin has the amboceptor-complement structure we would expect the complement to be destroyed by heat and that the amboceptor would combine with the bacteria, which when treated with fresh serum would be phagocyted because of the complement added. They explain this, however, by saying, "that in the heated serum there no longer is opsonin capable of union with bacteria."

(As a matter of fact, we have already performed a few experiments which show that there is a substance in the heated serum which combines with the bacteria, and which renders them much more susceptible to phagocytosis on the addition of a small amount of normal serum than are the untreated bacteria.)

Muir and Martin say: "We have thus tested the three chief varieties of immune bodies ('amboceptors'), namely, those obtained by the injection of (*a*) red blood corpuscles, (*b*) serum, and (*c*) bacteria, respectively, and have found that in each case the combination of receptor plus immune body removes the opsonin of normal serum as tested by an emulsion of the staphylococcus aureus."

They further say: "We have also shown that a bacterium treated with an immune body takes up more of the normal opsonin than the same bacterium untreated. If we define a complement from the chemical point of view as above explained, it is evident that the thermolabile opsonins of normal serum belong to the group of complements. As shown above, we found a striking resemblance in the diminution of hemolytic, bactericidal, and opsonic action produced by the different methods of absorption, but at present we pronounce no opinion as to the identity or non-identity of the substances producing these effects."

In consideration of the first part of Muir and Martin's work it seems to us that the fact that the combination of receptors plus immune body removes the opsonin of normal serum, for the staphylococcus aureus by no means proves that the opsonin of the normal serum has the nature of complement alone, for it is evident that this treatment might well remove the thermolabile, or complement, portion of the opsonin and thus inactivate the serum for phagocytosis.

The second part of the experiment, where they say that a bacterium treated with an immune body (amboceptor) takes up more of the normal opsonin than the same bacterium untreated, is very far from proving that the opsonin is of the nature of a complement; for consider what the term "immune body" means in their experiments. Muir and Martin injected a rabbit with washed ox corpuscles, which gave rise to the production of a hemolytic serum in the rabbit for the ox corpuscles. This immune rabbit serum, when heated to a temperature sufficient to destroy the complement, is what they constantly speak of as "immune body." It is evident that if opsonins consist of two parts, amboceptor and complement, the heating to which this rabbit's serum was subjected would destroy the complement and inactivate the serum. It would not, however, destroy the amboceptor, and this in turn would combine with the bacteria, which when added to fresh serum would be more highly opsonized than untreated bacteria, and naturally the phagocytosis might be very much higher. This gives no indication or proof as to whether the amboceptor and complement which produce hemolysis are the same as the amboceptor and complement which may be considered to produce phagocytosis, as they themselves admit.

If, after treating their guinea-pig serum with the combination of cell receptor plus immune body, which treatment they found to remove the phagocytic power of the treated serum, they had then added a little fresh guinea-pig serum, it is quite possible that the phagocytic power of the serum would have been considerably restored.

The validity of this criticism as coming from those who have not worked with hemolytic serum may be questioned, and our remarks on this point are given simply by way of suggestion.

GENERAL CONCLUSIONS.

Our experiments point to the following conclusions:

(1) In confirmation of the work of others we have found,

a.—That normal human serum heated to 55° centigrade or over for ten minutes loses its power to produce phagocytosis, and

b.—That normal human serum diluted 1/15 or over with salt solution gives a markedly decreased phagocytosis, as compared with undiluted serum, but still higher than the phagocytosis produced by the heated serum or with salt solution alone.

(2) We have found that if normal human serum diluted 1/15 be added to serum previously heated to temperatures between 55° centigrade and 60° centigrade for ten minutes a phagocytosis is produced which is much greater than the sum of the phagocytosis of the serums taken separately.

(3) The phagocytic power of normal human serum heated at 60° centigrade for ten minutes is also restored to a certain extent by normal guinea-pig serum diluted 1/25. (One experiment.)

(4) The above facts demonstrate that there is in the heated serum some substance whose opsonic power can be largely restored by relatively small amounts of fresh serum, and that this is probably due to the presence of two substances in normal human serum whose combined action is necessary to produce phagocytosis; one of these, the thermolabile portion, is probably in excess of the other, the thermostable substance, or else it has a ferment-like action.

(5) On the basis of Ehrlich's theory, our experiments tend to show that opsonins of normal human serum, instead of being simple substances like toxins and complements capable of forming "oid" modifications on heating, in all probability belong rather to that group

of antibodies having a double amboceptor-complement structure like the hemolysins and bacteriolysins. Whether this is equally true for the opsonins of immune sera we are not prepared to say.

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EXPERIMENTS IN FAVOR OF THE AMBOCEPTOR-COMPLEMENT STRUCTURE OF THE OPSONIN OF NORMAL HUMAN SERUM FOR THE STAPHYLOCOCCUS ALBUS.*

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In our preceding paper we showed by experiment that a normal human serum which has been inactivated by heating at 55° to 60° centigrade for ten minutes may have its opsonic power restored by the addition of an amount of diluted serum, which of itself produces a comparatively small phagocytosis under the same conditions. Inasmuch as this phenomenon is identical with that observed in the case of hemolytic and bactericidal sera, and as such sera are supposed to depend for their activity on the presence of amboceptor and complement, it seemed likely that the substance which produces phagocytosis, known as opsonin, has a similar structure, the more so, since the arguments

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advanced by previous observers against this view seemed to be in no case conclusive.

If, however, the amboceptor-complement structure is the true one for opsonin it ought to be possible to perform the following experiments:

(1) The bacteria should be able to combine with the amboceptors in a heated serum (55° to 60° centigrade for ten minutes). Such bacteria, treated with heated serum, washed in salt solution, and then made up to a suspension of the same density as the untreated bacteria, should give a low phagocytosis taken by themselves, but a very much higher phagocytosis when treated with a dilute normal serum than bacteria which have not been treated with heated serum.

(2) A serum heated at 55° to 60° centigrade for ten minutes, if treated with enough bacteria to remove all the amboceptors from it, should be incapable of reactivation with a dilute normal serum. Of course it should give no phagocytosis itself.

(3) If the complement is in excess of the amboceptors, as would seem likely from the reactivation of heated serum, it ought to be possible to remove the amboceptors from a normal serum by adding to it a sufficient number of bacteria and still leave in solution enough complement to reactivate well a heated serum. Against the probability of such an experiment being a success is the statement of Muir and Martin* that "bacteria alone absorb a certain amount of complement," and the observation of Bulloch and Atkin that no complement-like body could be separated out which, with a heated serum, would have an opsonic effect. As these latter authors also came to the conclusion in the same paper that "the action of heat is to destroy the opsonin and not merely to convert it into a nonopsonisable modification," it may be well to consider how they did their work.

They give only one experiment on this point, which we quote at length:

Experiment II (on page 386, "Proceedings of the Royal Society," 1904-5, LXXIV).—In this experiment an attempt was made to determine whether at 0° centigrade a complement-like body could be separated out, which with heated serum would exert an opsonic effect.

Technic.—(1) Normal serum mixed with emulsion of cocci, in equal parts, at 0° centigrade for fifteen minutes. The mixture was then centrifugalized, and separated into a supernatant fluid (A) and a deposit (A′). (2) Serum heated to 60° centigrade for fifteen minutes, mixed with cocci (āā), and placed at 0° centigrade for fifteen minutes. It was then centrifugalized, and separated into supernatant fluid (B), and a deposit (B′). Controls were supplied by normal serum (in appropriate dilutions), digested with "normal" cocci and corpuscles at 37° centigrade, and heated serum under the same conditions.

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*Muir and Martin: "On the Combining Properties of Opsonins and Normal Serum," *British Medical Journal,* December 22, 1906, page 1783.

RESULTS.

			Cocci per leukocyte.
(1) (Control.) Normal serum (2-fold solution)	+ "normal" cocci	+ corpuscles	= 25.0
(2) (Control.) Normal serum (4-fold solution)	+ " "	+ "	= 18.0
(3) (Control.) Serum heated to 60° centigrade for fifteen minutes	+ " "	+ "	= 2.0
(4) Fluid A + heated serum (āā)	+ " "	+ "	= 2.0
(5) Fluid A	+ " "	+ "	= 2.0
(6)	cocci A′	+ "	= 22.0
(7)	cocci B′	+ "	= 4.0

Remarks.—This experiment shows that the opsonin is very different in type from a lysin, as apparently no complement-like body remains in the supernatant fluid after the serum has been digested at 0° centigrade. The low reading in the case of the deposit B′ would also lead to the supposition that the action of heat at 60° centigrade has been to destroy the opsonin altogether. This supposition is confirmed by the following experiment:

EXPERIMENT.

Technic.—Normal serum was heated to 60° centigrade for fifteen minutes, then mixed with an equal quantity of staphylococcus emulsion, and digested at 37° centigrade for fifteen minutes, the deposit of cocci (A) being then removed by the centrifuge. The deposit (A) was then divided into two parts, one being reserved for the opsonic test, the other being mixed with normal serum. The mixture was digested for thirty minutes: the centrifuge was then applied, so as to separate a supernatant fluid (B) from a deposit of cocci (B′).

RESULTS.

			Cocci per leukocyte.
(1) (Control.) Normal serum	+ normal cocci	+ corpuscles	= 18.6
(2) (Control.) Normal serum (2-fold dilution)	+ " "	+ "	= 16.0
(3) (Control.) Heated serum	+ " "	+ "	= 0.5
(4) Normal serum	+ cocci A	+ "	= 15.5
(5) Fluid B	+ normal cocci	+ "	= 10.0
(6)	cocci B	+ "	= 15.0

This experiment bears out the suggestion above, that heat destroys the opsonin. The cocci (A), having been quite uninfluenced by the heated serum, were capable of being opsonized by normal serum, and they were further, as shown in Number 5, capable of abstracting all the opsonin out of normal serum. After being acted on by the normal serum, the mere addition of corpuscles demonstrated that they had been acted upon by the opsonin (Number 6).

On page 379 Bulloch and Atkin state that "In all cases the proportion of serum, bacteria, and corpuscles was 3:1:3." Comparing this with the proportions which we have been using, we see that in their phagocytic mixtures the corpuscles form forty-three per cent, the serum forty-three per cent, and the bacteria fourteen per cent, whereas in our phagocytic mixtures the corpuscles form forty per cent, the serum twenty per cent, and the bacteria twenty per cent. The remaining twenty per cent is made up of salt solution or a different serum, as the experiment requires. The chief difference lies in the amount of serum used, which is over twice as great in their phagocytic mixtures as in ours. It is interesting to note that they diluted their normal serum in these experiments.

Examination of Bulloch and Atkin's first experiment, "Experiment 2," shows that the controls of Numbers 1, 2, and 3 behaved as one might expect. "Fluid A," which was a normal serum previously treated with bacteria at 0° centigrade for fifteen minutes, and the bacteria then removed by centrifugalizing, had evidently had its opsonin removed, because it gave a very low phagocytosis, as did the heated serum (Number 5). It failed to reactivate a heated serum (Number 4), from which they conclude that there was no complement left, and consequently there is no complement for opsonin. That such conclusions should never be made on the basis of only one experiment goes without saying.

There are three important points on which they give us no information: (1) The precautions employed to keep the temperature of the normal serum treated with bacteria constantly at 0° centigrade during the period of centrifugalizing; (2) The length of time the bacteria remained in contact with the serum; (3) The thickness of the bacterial suspension used. The fact that they speak of keeping the mixture of serum and bacteria at 0° centigrade for fifteen minutes and make no mention of the temperature of the centrifuge suggests that perhaps no precautions were taken to keep the latter cold, in which case, if the bacteria were considerably in excess, they might very likely remove both the amboceptors and complement from the serum, which then would be unable to reactivate a heated serum. In this connection we wish to quote from Ricketts ("Infection, Immunity, and Serum Therapy," page 146), because of the clear manner in which he states the matter. Speaking of hemolytic serum he says:

"Ehrlich and Morganroth devised a method by which amboceptors may be separated from a fresh immune serum without in any way injuring the complement. This is accomplished by performing a binding experiment, already alluded to, at low temperature. The serum containing both amboceptors and complement is cooled to 0° centigrade or slightly above, by means of a freezing mixture of salt and ice. A suspension of the homologous corpuscles is cooled to the same point, the serum is added and the mixture maintained at 0° to 4° centigrade for fifteen or twenty minutes. At the end of this time the sensitized cells are removed by immediate centrifugation at low temperature, and are washed entirely free from serum by the use of ice cold salt solution. If the low temperature has been adhered to rigorously and the work done quickly, the corpuscles are not laked during the manipulation in spite of the presence of both amboceptors and complement. Furthermore, the washed, sensitized cells remain intact even when their temperature reaches that of the thermostat, wheréas if some fresh normal serum or the serum from which the amboceptors were absorbed is added, they undergo hemolysis as readily as when treated with the active immune serum. The original immune serum is now a solution of complement, and the fresh corpuscles which are added to it are not dissolved because of the absence of amboceptor.

"These results show the following important facts: Amboceptor and complement exist side by side in an immune serum, not as a united substance. Union of amboceptor with cell is independent of complement, the latter being taken up only after the amboceptor cell reaction has occurred. Amboceptors unite with cells at a low temperature, whereas complement requires a higher temperature for its union and for the ferment-like activity by which it dissolves or kills the cells."

The second experiment of Bulloch and Atkin is still more interesting than that first quoted, because one would expect just such results if the opsonin had a complement-amboceptor structure. Following their own line of thought we may say that the cocci (A), having combined with the amboceptors in the heated serum, were complemented by the normal serum, and they were further, as shown in Number 5, capable of abstracting all the complement out of the normal serum, and perhaps all the amboceptors also, if the bacterial cell receptors were not already fully occupied by amboceptors from the heated serum. After being acted on by the normal serum, the mere addition of corpuscles demonstrated that they had been acted upon by both complement and amboceptor (Number 6).

We herewith report our experiments in the order in which they were made.

Technic.—The only important addition to our technic, which in the main is the same as that given in our previous paper, consists in the making of a series of suspensions of barium sulphate in acacia water for the more accurate estimation of the density of our bacterial suspensions. They were made as follows:

(1) Six solutions of barium chloride having the following strengths: N/5, N/10, N/20, N/40, N/80, and N/160.

(2) A solution of sodium sulphate was made having a strength of N/5 or a little over in acacia water.

Equal parts of the sodium sulphate solution were then added to the same quantity of each of the six barium chloride solutions, resulting in a series of precipitates of barium sulphate in acacia water which would have the following strengths if the barium sulphate were in solution, N/10, N/20, N/40, N/80, N/160, N/320. The six suspensions were then put into tubes of the same caliber as the mixing tubes used for holding bacterial suspensions, sealed in the flame, and numbered 1, 2, 3, 4, 5, and 6, beginning with the most dense. The acacia may add slightly to the opacity of the suspensions, but the amount is quite negligible.

Experiments.—Our first point was to prove for ourselves that there is something in heated serum which combines with staphylococci and does not wash off in salt solution: and that bacteria so treated give a higher count with a dilute normal serum than a suspension of untreated staphylococci of equal density. To this end the following experiment was made.

EXPERIMENT XII.—JULY 1, 1907.

Method.—Heated serum.—Two tubes of serum were heated side by side in the water bath at 56° to 57° centigrade for ten minutes. Bacteria.—A rather thick suspension of staphylococcus albus was made in the usual manner. A large volume of this suspension was taken up with a long coarse pipet and added to about one and one-fourth volumes of heated serum, and the mixture incubated at 37° centigrade for fifteen minutes. The mixture was then centrifugalized after adding about one-half volume of salt solution to render the suspension less dense, with the idea that the bacteria would gravitate faster. After forty minutes the supernatant fluid was pipetted off close to the bacteria, an equal quantity of salt solution added and thoroughly mixed. It was again centrifugalized for thirty-five minutes, the supernatant fluid was slightly opalescent as before and was removed close to the sediment. One volume of salt solution, taken up with the same long coarse pipet, which had been previously washed, was then added to the sediment and made into a homogeneous suspension. The following phagocytic mixtures were made:

		Volumes.	Count.
(1)	Corpuscles	2	
	Normal serum	1	
	Staphylococci (untreated)	1	
	Salt solution	1	22.50
(2)	Corpuscles	2	
	Staphylococci (untreated)	1	
	Salt solution	2	0.32
(3)	Corpuscles	2	
	Serum diluted 1/15	1	
	Staphylococci (untreated)	1	
	Salt solution	1	1.92

		Volumes.	Count.
(4)	Corpuscles	2	
	Heated serum (56°-57° centigrade)	1	
	Staphylococci (untreated)	1	
	Salt solution	1	0.34
(5)	Corpuscles	2	
	Staphylococci treated with heated serum	1	
	Salt solution	2	1.72
(6)	Corpuscles	2	
	Serum diluted 1/15	1	
	Staphylococci treated with heated serum	1	
	Salt solution	1	13.73
(7)	Corpuscles	2	
	Heated serum (56°-57° centigrade)	1	
	Staphylococci treated with heated serum	1	
	Salt solution	1	1.00
(8)	Corpuscles	2	
	Heated serum (56°-57° centigrade)	1	
	Serum diluted 1/15	1	
	Staphylococci (untreated)	1	9.90
(9)	Corpuscles	2	
	Serum diluted 1/15	2	
	Staphylococci (untreated)	1	5.42

This supports our first contention, and if confirmed by subsequent experiments would seem to leave no question that something in heated serum so affects staphylococci as to render them more readily opsonized by diluted normal serum.

As in our former paper, we omit in the succeeding experiments such details as the number of volumes of corpuscles or staphylococcus suspension employed, inasmuch as all the phagocytic mixtures were made up to five volumes like the ones given above (Experiment XII).

In all these experiments the corpuscles and serum came from the same person (W. S. C.), and the bacteria were the same strain of staphylococcus albus employed in the experiments in our former paper. Heated serums were all heated ten minutes, as described before.

EXPERIMENT XIII.—JULY 3, 1907.

Method.—Three-fourths of an agar culture was ground up with .3 to .5 cubic centimeter of fresh normal serum to a very thick suspension. This was incubated in a mixing tube at 37° centigrade for ten minutes. About an equal volume of salt solution was then added, and the resulting suspension centrifugalized for one hour. The supernatant fluid was removed and divided into two portions, one of which was heated at 56° centigrade for ten minutes and is spoken of as "56°

centigrade staphylococcus serum," while the other unheated portion is called simply "Staphylococcus serum." The diluted and heated serums were made in the usual manner.

PHAGOCYTIC MIXTURES.

		Count.
(1)	Normal serum	23.42
(2)	Salt solution	0.28
(3)	Serum diluted 1/15	2.32
(4)	Heated serum 56° centigrade	0.28
(5)	Staphylococcus serum + normal serum (no staphylococci added)	0.42
(6)	Staphylococcus serum	0.84
(7)	56° centigrade staphylococcus serum	0.56
(8)	Staphylyococcus serum + serum diluted 1/15	1.64
(9)	56° centigrade staphylococcus serum + serum diluted 1/15	0.66
(10)	Heated serum 56° centigrade + serum diluted 1/15	16.34
(11)	Heated serum 56° centigrade + staphylococcus serum was omitted by mistake.	

This experiment shows nothing new. It simply confirms our previous observations that bacteria may be practically removed from a serum by centrifugalizing for one hour; that a heated serum may be reactivated with a dilute serum; that a serum may have its opsonic power removed by the addition of bacteria, and that such an inactivated serum may not necessarily be reactivated with a dilute serum in the way that a heated serum is reactivated.

EXPERIMENT XIV.

Method.—"Staphylococcus serum" was made by stirring up a large loop of staphylococci with about .4 cubic centimeter of normal serum, about an equal volume of salt solution was added and the mixture centrifugalized for one and one-half hours. The supernatant fluid, "staphylococcus serum," was removed close to the sediment, and the bacteria washed with about .6 cubic centimeter of salt solution, centrifugalized, and made into a rather thick suspension called "normal serum staphylococcus." A somewhat thinner staphylococcus suspension was made as usual of a density about four and one-half. An equal volume of this suspension was mixed with one volume of serum heated at 56°-57° centigrade for ten minutes and the mixture centrifugalized one and one-half hours. The supernatant serum was called "56° centigrade staphylococcus serum." The bacteria, after being washed once and recentrifugalized, were made up into a suspension of nearly the same strength as the original staphylococcus suspension, and called "56° centigrade serum staphylococcus." Some tests were also made with the wash waters, which were not as well chosen as they might have been.

PHAGOCYTIC MIXTURES.

		Count.
(1)	Normal serum	26.90
(2)	Salt solution	0.80
(3)	Serum diluted 1/15	5.70
(4)	Heated serum 56°-57° centigrade	0.68
(5)	Heated serum 56°-57° centigrade + serum diluted 1/15	21.10
(6)	Staphylococcus serum	1.54
(7)	Heated serum 56°-57° centigrade + staphylococcus serum	5.16
(8)	56° centigrade staphylococcus serum	0.52
(9)	56° centigrade staphylococcus serum + staphylococcus serum	1.82
(10)	56° centigrade serum staphylococcus	2.56
(11)	56° centigrade serum staphylococcus + serum diluted 1/15	34.60
(12)	56° centigrade serum staphylococcus + staphylococcus serum	8.56
(13)	56° centigrade serum staphylococcus + 56° centigrade staphylococcus serum	5.76
(14)	Wash water from the 56° centigrade serum staphylococcus + staphylococcus serum	4.26
(15)	Normal serum staphylococcus (count of 25 corpuscles, not accurate)	63.60 ±
(16)	Wash water from the normal serum staphylococcus	0.70

This experiment is very imperfect in many places. It strongly confirms the point brought out by Experiment XII, however, that the bacteria are much more readily opsonized by a dilute normal serum if they have been first treated with a sufficient amount of heated serum. The count of Number 10, 56° centigrade serum staphylococcus, is somewhat higher than the count of Numbers 2 and 3, salt solution or heated serum alone, a point which Dean observed and from which he argued that the opsonin must be thermostable. Perhaps a small portion of it is. It hardly seems possible that this can be due to experimental error in counting or to spontaneous phagocytosis in the presence of a reduced salt content, or even to the thickness of the bacterial suspension as Wright suggested, because both of the latter must have been practically the same in Number 10 as in Numbers 2 and 3.

The phagocytic counts themselves are suggestive.

Number 2 gave:

0-0-0-0-15, 0-0-0-0-0, 1-0-0-1-0, 0-0-0-1-0, 1-1-0-0-0,
0-0-0-3-11, 1-0-0-0-0, 0-0-0-0-0, 0-0-3-1-0, 0-0-0-0-1, Average = 0.80.

Number 4 gave:
0-0-0-0-0, 1-0-2-0-0, 0-0-0-0-0, 4-0-4-0-0, 3-0-0-4-0,
2-5-0-0-0, 1-1-2-3-0, 0-0-0-0-1, 1-0-0-0-0, 0-0-0-0-0, Average = 0.68.

Number 10 gave:
0-0-0-4-0, 12-6-6-0-7, 3-3-0-0-0, 0-2-0-0-0, 0-0-3-0-1,
0-0-0-0-2, 0-3-0-2-6, 0-3-9-19-0, 18-0-0-6-0, 0-0-0-29-0, Average = 2.56.

Counts similar to Number 10 occurred in Numbers 12, 13, and 14, high counts mixed with zero counts. Just what the reason for this is we are not sure, but suspect an error of technic in the treatment of the leukocytes. Clumps in the bacterial suspensions may also play some part.

The phagocytic power of the normal serum treated with staphylococci was practically removed. When added to a heated serum it gave a somewhat higher count, but the reactivation was not so marked as to permit the conclusion that much, if any, complement remained in solution.

The high count in Number 15 confirms the opinion of Wright and Douglas that there is something in normal serum which acts on bacteria and which prepares them for phagocytosis. The suspension in this case was much thicker than in the other two suspensions.

EXPERIMENT XV.—JULY 11, 1907.

Serums used.

(1) Normal serum.
(2) Salt solution.
(3) Serum diluted 1/15.
(4) Heated serum 57° centigrade.
(5) Heated serum 57° centigrade treated with staphylococci and the bacteria removed by centrifugalizing.
(6) Normal serum treated with staphylococci and the bacteria removed by centrifugalizing.
(7) Normal serum treated with staphylococci which were first treated with 57° centigrade serum and washed.

Staphylococcus Suspensions.

(1) An ordinary suspension. Density about 4½.
(2) Staphylococci treated with normal serum and washed.
(3) Staphylococci treated with 57° centigrade serum and washed.
(4) Staphylococci treated with 57° centigrade serum and washed and then treated with normal serum.

Suspensions of staphylococci with both the normal and heated serums were made by stirring up a large loop of bacteria with about .4 cubic centimeter of the serum to a thick suspension and centrifugalizing these for two hours. The serums were labeled "Normal staphylococcus serum" and "57° centigrade staphylococcus serum" respectively. The sediments were each mixed with .6 cubic centimeter of salt solution and recentrifugalized for one hour. The supernatant salt solution was discarded and the washed bacteria made into a suspension with about .3 cubic centimeter of salt solution. Of course no two of the bacterial suspensions in this case were of the same density, although they did not differ much to the eye.

Phagocytic Mixtures.

		Count.
(1)	Normal serum	25.16
(2)	Salt solution	0.32
(3)	Serum diluted 1/15	6.16
(4)	Heated serum 57° centigrade	0.64
(5)	Heated serum 57° centigrade + serum diluted 1/15	20.50
(6)	57° centigrade staphylococcus serum	0.28
(7)	57° centigrade staphylococcus serum + serum diluted 1/15	4.06
(8)	Normal staphylococcus serum	8.02
(9)	Normal serum staphylococcus	14.30
(10)	Normal serum treated with 57° centigrade serum staphylococcus	22.06
(11)	Normal serum treated with 57° centigrade serum staphylococcus + serum diluted 1/15	18.86
(12)	Heated serum 57° centigrade + normal serum treated with 57° centigrade serum staphylococcus	21.22
(13)	57° centigrade serum staphylococcus treated with normal serum and washed	34.12
(14)	Normal staphylococcus serum + heated serum 57° centigrade	20.42
(15)	Normal serum treated with 57° centigrade serum staphylococcus + normal staphylococcus serum	16.34
(16)	57° centigrade serum staphylococcus	4.88
(17)	57° centigrade serum staphylococcus + serum diluted 1/15	29.10

Mixtures 1 to 6 are controls and need no comment. Number 7 shows that the amboceptors of the heated serum were practically entirely removed, the phagocytic count being about the same as for 1/15 serum alone, no reactivation; Number 8 suggests that not enough bacteria were added to the normal serum to absorb all the amboceptors. A considerable portion of them, however, were evidently removed because of the greatly reduced count as compared with normal serum. The bacteria in Number 9 treated with normal serum were certainly opsonized, for they give a much larger count than the spontaneous phagocytosis of Number 2. The object of Number 10 was to remove all the complement from the normal serum and leave a solution of amboceptors. The high count shows, however, that not enough bacteria were probably added and hence counts 11 and 12 have no significance.

Number 13 needs no comment. Number 14 shows a distinct reactivation of a heated serum by a normal serum whose opsonic power has been largely reduced by treating it with staphylococci. It is interesting to compare this count with Number 5. The low count of Number 15 as compared with Number 10 is without explanation.

Numbers 16 and 17 show how staphylococci treated with heated serum are readily opsonized by a dilute normal serum.

Experiment XVI.—July 13, 1907.

Serums used.

(1) Normal serum.
(2) Salt solution.
(3) Serum diluted 1/15.
(4) Heated serum 57° centigrade.
(5) Heated serum 57° centigrade diluted ½.
(6) Heated serum 57° centigrade treated with an equal volume of a very thick staphylococcus suspension.
(7) Heated serum 57° centigrade treated with three volumes of an ordinary staphylococcus suspension.

Staphylococcus Suspensions used.

(1) A very thick milky suspension. One volume of this was added to an equal volume of heated serum and centrifugalized for two and two-thirds hours. The supernatant serum was clear and formed serum Number 6.

(2) A rather thin ordinary suspension for the phagocytic mixtures.

(3) Three volumes of this second suspension were added to one volume of heated serum and centrifugalized for two hours. The supernatant fluid formed serum Number 7. The sediment was washed with .5 cubic centimeter of salt solution and recentrifugalized for one and one-fourth hours. Three volumes of salt solution taken up with the same pipet with which these bacteria were first measured out was mixed with the sediment, making a mixture of about the same density as before. The pipet was of course washed before using.

Phagocytic Mixtures.

	Count.
(1) Normal serum	10.26
(2) Salt solution	0.04
(3) Heated serum 1/15	2.36
(4) Heated serum 57° centigrade	0.22
(5) Heated serum 57° centigrade + serum diluted 1/15	12.08
(6) Heated serum 57° centigrade diluted ½ + serum diluted 1/15	9.60
(7) Heated serum 57° centigrade treated with thick staphylococcus suspension	0.16

	Count.
(8) Heated serum treated with thin staphylococcus suspension	0.06
(9) Heated serum 57° centigrade treated with thick staphylococcus suspension + serum diluted 1/15	1.40
(10) Heated serum 57° centigrade treated with thin staphylococcus suspension + serum diluted 1/15	1.78
(11) 57° centigrade serum staphylococcus	0.52
(12) 57° centigrade serum staphylococcus + serum diluted 1/15	6.18

This experiment shows, as has been shown before, that a heated serum loses its power to be reactivated when treated with enough staphylococci, and that staphylococci treated with heated serum are more readily opsonized by a dilute normal serum than untreated staphylococci.

EXPERIMENT XVII.—JULY 15, 1907.

Method.—The bacterial suspension used was a rather thin one. Dilutions of this serum were made as indicated in the mixtures and one volume of heated serum 57° centigrade added to an equal volume of the suspensions. The bacteria were then removed from the staphylococcus serum mixtures by centrifugalizing for one and one-half hours.

PHAGOCYTIC MIXTURES.

	Count.
(1) Normal serum	9.29
(2) Normal serum diluted ½	12.04
(3) Salt solution	0.02
(4) Heated serum 57° centigrade	0.20
(5) Serum diluted 1/15	9.00
(6) Heated serum 57° centigrade + serum diluted 1/15	10.64
(7) Heated serum 57° centigrade diluted ½ + serum diluted 1/15	11.82
(8) Heated serum 57° centigrade treated with staphylococci + serum diluted 1/15	8.62
(9) Heated serum treated with staphylococci diluted ⅓ + serum diluted 1/15	10.18
(10) Heated serum 57° centigrade treated with staphylococci diluted 1/9 + serum diluted 1/15	11.92
(11) Heated serum 57° centigrade treated with staphylococci diluted 1/27	12.70
(12) Heated serum 57° centigrade treated with staphylococci + serum diluted 1/15 (no bacteria added to the mixture)	0.02

In this experiment the bacterial suspension proved so weak that practically all the bacteria were opsonized by the 1/15 serum (Number 5), which gave about the same count as the normal and the ½ normal serums. Consequently any changes that might take place in the heated serum could not show themselves, on the principle that any given number of bacteria can combine with a certain amount of opsonin and no more. We have observed repeatedly that an increase in the amount of serum in a phagocytic mixture above a certain point is not accompanied with any corresponding rise in the phagocytic count, which in many cases may even be decreased.

Experiment XVIII.—July 17, 1907.

Serums used.

(1) Normal serum.
(2) Normal serum diluted ½.
(3) Normal serum diluted 1/15.
(4) Salt solution.
(5) Heated serum 57° centigrade.
(6) Heated serum 57° centigrade diluted ½.
(7) Heated serum 57° centigrade treated with an equal volume of a very thick staphylococcus suspension.
(8) Heated serum 57° centigrade treated with ⅓ as much thick staphylococcus suspension.
(9) Heated serum 57° centigrade treated with ⅙ as much thick staphylococcus suspension.
(10) Heated serum 57° centigrade treated with 1/12 as much thick staphylococcus suspension.
(11) Heated serum 57° centigrade treated with 1/24 as much thick staphylococcus suspension.

The staphylococcus suspension used in the phagocytic mixtures was equal in density to one-third of the thick staphylococcus suspension. The bacteria were removed from the serums by centrifugalizing for two hours.

Phagocytic Mixtures.

		Count.
(1)	Normal serum	26.02
(2)	Serum diluted ½	29.00
(3)	Salt solution	0.60
(4)	Serum diluted 1/15	16.80
(5)	Heated serum 57° centigrade	1.10
(6)	Heated serum 57° centigrade + serum diluted 1/15	21.54
(7)	Heated serum 57° centigrade diluted ½ + serum diluted 1/15	23.48
(8)	Heated serum 57° centigrade treated with thick staphylococcus suspension + serum diluted 1/15	11.38
(9)	Heated serum 57° centigrade treated with ⅓ thick staphylococcus suspension + serum diluted 1/15	19.56
(10)	Heated serum 57° centigrade treated with ⅙ thick staphylococcus suspension + serum diluted 1/15	20.16

	Count
(11) Heated serum 57° centigrade treated with 1/12 thick staphylococcus suspension + serum diluted 1/15	19.26
(12) Heated serum 57° centigrade treated with 1/24 thick staphylococcus suspension + serum diluted 1/15	22.50
(13) Heated serum 57° centigrade treated with thick staphylococcus + serum diluted 1/15 (no staphylococci added)	0.02
(14) Staphylococci (thick suspension diluted ⅓) mixed with three volumes of heated serum 57° centigrade centrifugalized two hours, and the sediment washed, recentrifugalized and restored to its original density	5.98
(15) These same staphylococci + serum diluted 1/15	29.79

The high count given by the serum diluted 1/15 renders the change in the reactivatable power of the heated serums treated with progressively smaller amounts of staphylococci less evident than it otherwise probably would be.

As before the counts of Numbers 14 and 15 are interesting.

Number 14 gave:
1-0-0-0-4, 1-1-8-3-0, 0-0-2-0-0, 0-30-0-0-28, 26-17-0-5-0,
17-0-0-0-0, 100-0-9-0-12, 2-0-2-10-0, 0-0-20-0-0, 0-1-0-0-0,
Average = 5.98.

Number 15 gave:
47-68-90-14-57, 37-34-28-11-69, 10-44-7-33-8, 58-79-13-33,
32-39-48-41-3,
29-21-7-6-22, 90-5-18-5-28, 55-17-2-2-12, 37-5-6-18-10, 9-90-10-25,
Average = 29.79.

Experiments 19 and 20 were made for a different purpose and are omitted.

EXPERIMENT XXI.—JULY 27, 1907.

Method.—A thick staphylococcus suspension was made from one and one-half agar cultures with about .4 cubic centimeter of salt solution. Its density was about 1. Portions of this suspension were mixed with normal serum as follows:

		Volumes.
Mixture 1.	Thick staphylococcus suspension	1.
	Serum	1.
Mixture 2.	Thick staphylococcus suspension	1.
	Serum	2.
	Salt solution	1.
Mixture 3.	Thick staphylococcus suspension	1.
	Serum	3.
	Salt solution	2.

		Volumes.
Mixture 4.	Thick staphylococcus suspension	1.
	Serum	4.
	Salt solution	3.

The mixtures were incubated ten minutes before adding the salt solution and then centrifugalized one and one-half hours. The supernatant fluids were then removed and designated "Staphylococcus serum 1, 2, 3, and 4" respectively.

PHAGOCYTIC MIXTURES.

		Count.
(1)	Normal serum	21.80
(2)	Serum diluted ½	18.68
(3)	Serum diluted 1/20	1.72
(4)	Serum diluted 1/25	1.24
(5)	Salt solution	0.38
(6)	Heated serum 57° centigrade	0.34
(7)	Heated serum 57° centigrade + serum diluted 1/20	13.98
(8)	Heated serum 57° centigrade + serum diluted 1/25	11.32
(9)	Staphylococcus serum 1	0.48
(10)	Heated serum 57° centigrade + staphylococcus serum 1	1.60
(11)	Staphylococcus serum 2	0.38
(12)	Heated serum 57° centigrade + staphylococcus serum 2	3.22
(13)	Staphylococcus serum 3	2.58
(14)	Heated serum 57° centigrade + staphylococcus serum 3	5.26
(15)	Staphylococcus serum 4	0.42
(16)	Heated serum 57° centigrade + staphylococcus serum 4	4.54
(17)	Staphylococcus serum 2 (no staphylococci added)	0.00

This experiment would lead one to suppose that there was not much of any complement left after the serum had been treated with staphylococci, although inspection does show a slight reactivation of the heated serum, which is greater in Numbers 14 and 16 than in Numbers 10 and 12, as one would expect. The reason for this may lie in the use of too thick staphylococcus suspension, or more probably in the mistake of incubating the mixtures before centrifugalizing them, and so increasing the absorption of complement by bacteria if this occurs.

EXPERIMENT XXII.—JULY 29, 1907.

Method.—A thick staphylococcus suspension, density 1, was made as before and mixed with serum and salt solution in the following proportions:

		Volumes.
Mixture 1.	Thick staphylococcus	1.
	Serum	1.
Mixture 2.	Thick staphylococcus	1.
	Serum	3.
	Salt solution	2.

		Volumes.
Mixture 3.	Thick staphylococcus diluted ⅙	1.
	Serum	1.
Mixture 4.	Thick staphylococcus diluted ⅙	1.
	Serum	2.
	Salt solution	1.
Mixture 5.	Thick staphylococcus diluted ⅙	1.
	Serum	4.
	Salt solution	3.

These mixtures were not incubated but centrifugalized at once for one and one-half hours. The thick staphylococcus diluted ⅙ had a density of 3. What remained after making the mixtures was centrifugalized to remove the clumps, diluted to density 4½ and used in making up the phagocytic mixtures. The supernatant fluids were removed after centrifugalizing and labeled "Staphylococcus serum 1, 2, 3, 4, and 5," respectively.

PHAGOCYTIC MIXTURES.

		Count.
(1)	Normal serum	20.60
(2)	Serum diluted ½	22.06
(3)	Serum diluted 1/20	3.18
(4)	Salt solution	0.40
(5)	Heated serum 57° centigrade	0.58
(6)	Heated serum 57° centigrade + serum diluted 1/20	28.82
(7)	Staphylococcus serum 1	0.74
(8)	Heated serum 57° centigrade + staphylococcus serum 1	12.08
(9)	Staphylococcus serum 2	2.98
(10)	Heated serum 57° centigrade + staphylococcus serum 2	14.58
(11)	Staphylococcus serum 3	7.86
(12)	Heated serum 57° centigrade + staphylococcus serum 3	19.16
(13)	Staphylococcus serum 4	23.26
(14)	Heated serum 57° centigrade + staphylococcus serum 4	21.68
(15)	Staphylococcus serum 5	26.72
(16)	Heated serum 57° centigrade + staphylococcus serum 5	20.14
(17)	Staphylococcus serum 2 (no staphylococci added)	0.02

This is a great improvement over the preceding experiment, although it is evident that the "staphylococcus serums" did not reactivate a heated serum nearly as well as did the serum diluted 1/20, even when they gave a higher count alone. The cause of this is still obscure.

EXPERIMENT XXIII.—JULY 31, 1907.

Method.—As before, one and one-half agar cultures were made into a thick suspension with a density of about 1. With this the following mixtures were made with normal serum:

		Volumes.
Mixture 1.	Thick staphylococcus suspension	1.
	Serum	1.
Mixture 2.	Thick staphylococcus suspension	1.
	Serum	3.
	Salt solution	2.
Mixture 3.	Thick staphylococcus suspension	1.
	Serum	4.
	Salt solution	3.
Mixture 4.	Thick staphylococcus suspension	1.
	Serum	5.
	Salt solution	4.

These mixtures were centrifugalized for two hours without having been incubated and the supernatant serums removed and labeled "Staphylococcus serum 1, 2, 3, 4, and 5," as before. An ordinary staphylococcus suspension was made of density 4½ for the phagocytic mixtures.

PHAGOCYTIC MIXTURES.

		Count.
(1)	Normal serum	24.62
(2)	Normal serum diluted ½	25.86
(3)	Serum diluted 1/20	2.28
(4)	Salt solution	0.14
(5)	Heated serum 57° centigrade	0.70
(6)	Heated serum 57° centigrade + serum diluted 1/20	18.28
(7)	Staphylococcus serum 1	0.72
(8)	Heated serum 57° centigrade + staphylococcus serum 1	11.48
(9)	Staphylococcus serum 1 + serum diluted 1/20	1.68
(10)	Staphylococcus serum 2	1.50
(11)	Heated serum 57° centigrade + staphylococcus serum 2	14.52
(12)	Staphylococcus serum 2 + serum diluted 1/20	5.48
(13)	Staphylococcus serum 3	2.88
(14)	Heated serum 57° centigrade + staphylococcus serum 3	16.42
(15)	Staphylococcus serum 3 + serum diluted 1/20	10.62
(16)	Staphylococcus serum 4	1.74
(17)	Heated serum 57° centigrade + staphylococcus serum 4	16.66
(18)	Staphylococcus serum 4 + serum diluted 1/20	9.42

This experiment brings out the same points as the preceding, with the additional point that the "staphylococcus serums" which were able to give more than a zero count themselves appear to be slightly reactivated by the addition of serum diluted 1/20. The cause of this is not plain at present.

In spite of the many obvious imperfections in these experiments, it has seemed best to give the work as it was done up to date and the faults may show how easy it is to draw erroneous conclusions from insufficient data, as we may very likely have done ourselves.

SUMMARY.

In consideration of the first point, Do bacteria treated with heated serum and washed really absorb something from the heated serum which renders them more susceptible to phagocytosis when treated with a dilute normal serum than they were before? We offer the following table drawn from the preceding experiments, which seems to show that they do:

TABLE I.

Exp. No.	Controls.						Staphylococci Treated with Heated Serum and Washed + Diluted Serum.
	Normal Serum.	Salt Solution.	Heated Serum.	Diluted Serum	Heated Serum + Diluted Serum.	Staphylococci Treated with Heated Serum and Washed.	
12.......	22.50	0.32	0.34	1.92	9.90	1.72	13.73
14.......	26.90	0.80	0.68	5.70	21.10	2.56	34.60
15.	25.16	0.32	0.64	6.16	20.50	4.88	29.10
16.......	10.26	0.04	0.22	2.36	12.08	0.52	6.18
18.......	26.02	0.60	1.10	16.80	21.54	5.98	29.79

In consideration of the second point, Is a heated serum which has been treated with bacteria (to remove the reactivatable substance) less capable of being reactivated with a dilute normal serum than it was before? The second table seems to show that it is.

TABLE II.

Exp. No.	Controls.						Heated Serum Treated with Staphylococci + Diluted Serum.
	Normal Serum.	Salt Solution.	Heated Serum.	Diluted Serum.	Heated Serum + Diluted Serum.	Heated Serum Treated with Staphylococci	
15.......	25.16	0.32	0.64	6.16	20.50	0.28	4.06
16......	10.26	0.04	0.22	2.36	12.08	0.16 0.06	1.40 1.78
17.......	9.29	0.02	0.20	9.00	10.64		8.62 10.18 11.92 12.70
18.......	26.02	0.60	1.10	16.80	21.54		11.38 19.56 20.16 19.26 22.50

The high counts given by the diluted serums in the last two experiments render the figures in the last column less conclusive than they might otherwise have been. They suggest, however, that the reactivation of a heated serum increases as the number of staphylococci with which it has been treated is reduced.

In consideration of the third point, Can the opsonic power of a normal serum be removed by bacteria and still leave in solution a substance which will reactivate a heated serum? The third table strongly suggests the affirmative.

TABLE III.

Exp. No.	Controls.					Normal Serum Treated with Staph.	Heated Serum + Normal Serum Treated with Staph.	Normal Serum Treated with Staph. + Diluted Serum.
	Normal Serum.	Salt Solution.	Heated Serum.	Diluted Serum.	Heated Serum + Diluted Serum.			
13.......	23.42	0.28	0.28	2.32	16.34	0.84	....	1.64
14.......	26.90	0.80	0.68	5.70	21.10	1.54	5.16	
21.......	21.80	0.38	0.34	1.72	13.98	0.48	1.60	
				1.24	11.32	0.38	3.22	
						2.58	5.26	
						0.42	4.54	
22.......	20.60	0.40	0.58	3.18	28.82	0.74	12.08	
						2.98	14.58	
						7.86	19.16	
						23.26	21.68	
						26.72	20.14	
23.......	24.62	0.14	0.70	2.28	18.28	0.72	11.48	1.68
						1.50	14.52	5.48
						2.88	16.42	10.62
						1.74	16.66	9.42

The cause of the apparent reactivation of the normal serum treated with staphylococci by the diluted serum is not understood by us at present. We are hoping to obtain a larger amount of the reactivating substance by treating the serum with bacteria in the cold, and so to study its properties to better advantage. We have at least shown that it is possible to separate out a complement-like body which, with heated serum, does exert a distinct opsonic effect, even without going to the trouble of keeping the serum cold. That all these phenomena are fully explained by saying that they are due to the combined action of opsonic complement and amboceptor alone would be a rash statement to make. We think, however, that enough evidence has been obtained to show that this hypothesis is much more probable than the one advanced by Hektoen and Ruediger that opsonin has the simple structure of a toxin or complement.

CONCLUSIONS.

In this paper we present further evidence in favor of the theory that the opsonin in normal human serum for staphylococcus albus has a structure similar to that of the hemolytic and bacteriolytic sera, namely, that it depends for its activity on the combined action of two substances which behave like complement and amboceptor. This conclusion is based upon the following facts, the first of which formed the subject of our former paper:

(1) A heated normal serum may have its opsonic power largely or wholly restored by the addition of a dilute unheated serum.

(2) Stapholococci treated with heated serum and then washed are much more readily opsonized by a dilute normal serum than the same bacteria untreated.

(3) A heated serum loses its power to be reactivated if previously treated with a sufficient number of staphylococci.

(4) If a normal human serum is treated with enough staphylococci to practically remove its opsonic power, there may still be left in the serum a substance which will reactivate a heated serum.

Facts similar to these are true for bacteriolytic and hemolytic sera, but not for toxins or complements.

Ann Arbor, Lawrence Building.

THE SEPARATION OF OPSONIC AMBOCEPTOR AND COMPLEMENT IN THE COLD.*

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AND
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In our second paper we referred to the attempt made by Bulloch and Atkin[1] to separate out a complement-like body which with heated serum would exert an opsonic effect, and suggested that their failure may have been due to the addition of too many bacteria to the serum or possibly a neglect to keep the mixture cold during centrifugalization. We showed, however, that when not too many bacteria were added it was possible to practically remove the opsonic power of a serum without resorting to the use of cold, and still leave something in solution which would decidedly reactivate a heated serum. It remained to be determined whether, by keeping the mixture of serum and bacteria at 0° centigrade or thereabouts, it is possible to remove the amboceptors alone and thus obtain a serum containing more complement, and a bacterial suspension in which the bacteria are only combined with amboceptors.

Method.—The temperature of the cold room varied very slightly. In the first experiment it was 5° centigrade at the start, but soon fell to

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0° centigrade and later to — 3° centigrade. In the second experiment it started at 0° centigrade and rose very slowly to 2° centigrade. In the third experiment it was — 1° centigrade at first, rose once to 0° centigrade and then fell to — 1.5° centigrade. Hence it may be seen that the cold room was most admirably adapted for an experiment of this kind, where it is important that the temperature be as low as possible without freezing the suspensions.

In all cases the centrifuge, bacterial suspensions, serum, pipets, and salt solutions were placed on the floor of the cold room and allowed to stand for one hour before the serum and bacteria were mixed and centrifugalization begun.

Staphylococcus serum.—This was made in the first two experiments by mixing a thick suspension of staphylococci, density one, with normal human serum (W. S. C.) in equal volumes in the cold, and removing the bacteria by centrifugalization for one and one-quarter hours. In the third experiment about .3 cubic centimeter of serum was mixed with staphylococci from one and two-thirds agar cultures and allowed to stand fifteen minutes before centrifugalization. The supernatant serum is spoken of in all cases as "Staphylococcus serum."

Serum staphylococcus.—In the first experiment the bacterial deposit from staphylococcus serum mixaure was washed twice with about .6 cubic centimeter of cold salt solution and then made up, judging by the eye, to a suspension nearly equal in density to that of the ordinary bacterial suspension used. In this case the clumps were first removed by centrifugalization. In the other two experiments the ordinary suspension was mixed with normal serum in the proportion of two to one, washed twice and the sediment restored to its original density by the addition of the same amount of salt solution as was first taken of the bacterial suspension.

The bacterial suspension had a density of 4.5, 4.0, and 4.5 in the first, second, and third experiments respectively.

The rest of the technic was that described by us in our first paper.

PHAGOCYTIC MIXTURES.

	Volumes.	Phagocytic Counts.		
Experiment number		24.	25.	26.
(1) Corpuscles	2			
Normal serum	1			
Staphylococcus suspension	1			
Salt solution	1	17.80	37.48	20.78
(2) Corpuscles	2			
Serum diluted 1/20	1			
Staphylococcus suspension	1			
Salt solution	1	0.86	2.48	1.58
(3) Corpuscles	2			
Staphylococcus suspension	1			
Salt solution	2	0.50	1.02	0.40

		Volumes.	Phagocytic Counts.		
(4)	Corpuscles	2			
	Heated serum 57° centigrade	1			
	Staphylococcus suspension	1			
	Salt solution	1	0.30	1.94	0.52
(5)	Corpuscles	2			
	Heated serum 57° centigrade	1			
	Serum diluted 1/20	1			
	Staphylococcus suspension	1	6.72	19.82	17.12
(6)	Corpuscles	2			
	Staphylococcus serum	1			
	Staphylococcus suspension	1			
	Salt solution	1	1.46	3.94	0.96
(7)	Corpuscles	2			
	Heated serum 57° centigrade	1			
	Staphylococcus serum	1			
	Staphylococcus suspension	1	10.84	21.38	14.12
(8)	Corpuscles	2			
	Staphylococcus serum	1			
	Serum diluted 1/20	1			
	Staphylococcus suspension	1	3.78	9.20	1.68
(9)	Corpuscles	2			
	Serum staphylococcus	1			
	Salt solution	2	2.84	0.96	1.62
(10)	Corpuscles	2			
	Serum staphylococcus	1			
	Serum diluted 1/20	1			
	Salt solution	1	22.70	15.90	26.34
(11)	Corpuscles	2			
	Serum staphylococcus	1			
	Staphylococcus serum	1			
	Salt solution	1	20.92	20.94	13.36
(12)	Corpuscles	2			
	Serum staphylococcus	1			
	Heated serum 57° centigrade	1			
	Salt solution	1		5.18	16.06
(13)	Corpuscles	2			
	Staphylococcus serum	1			
	Serum diluted 1/20	1			
	Salt solution	1	0.12	0.00	0.50

It is evidence from the table that staphylococci are not opsonized to any very great extent with normal serum in the cold. That they have, nevertheless, combined in the cold with something in the serum is shown by the high counts which they give when treated with "Staphylococcus Serum" or diluted serum. The counts on the whole are what one might expect on the theory that normal opsonin has an amboceptor-complement structure.

The counts given by mixture 12, however, need explanation.

The first of these was as follows:

10-1-1-0-22, 13-8-1-0-4, 17-9-1-0-0, 9-10-5-9-10, 0-0-8-0-0,
20-0-22-0-1, 3-9-1-10-8, 4-0-07-4, 8-1-1-0-1, 0-11-3-0-7,
Average, 5-18.

The second was even more remarkable:

12-5-26-38-3, 9-14-22-35-27, 5-17-25-11-62, 82-0-18-12-32,
0-9-13-25-15,
1-3-15-10-8, 33-0-4-25-0, 4-36-9-18-4, 27-5-17-4-0, 17-13-20-8-5,
Average, 16.06.

It will be noticed that forty-six per cent on the average of these two counts are under six, whereas in the case of the corresponding two mixtures Number 9, ninety-five per cent of the counts were under six, and in mixtures 4, ninety-seven per cent were equally low.

The contrast which these counts make with the controls may perhaps be best brought out by the following table:

Phagocytic Mixture Number	Percentage of Leucocytes containing 0 to 5 Cocci	Percentage of Leucocytes containing 16 to 100 Cocci
2	93	0
3	100	0
4	97	0
6	86	3
9	95	2
12	46	24

The presence of clumps of bacteria can hardly explain the difference in the counts of mixtures nine and twelve. It reminds one a little of the count given by bacteria which have been treated with heated serum and washed, which is usually higher than that given with heated serum in a phagocytic mixture.

Since our first two papers were written, the work of Dean[2] in reactivating a heated immune serum with unheated serum has come to our attention. Dean's production of an anti-complement serum is additional evidence in favor of the amboceptor-complement structure of opsonin.

SUMMARY.

(1) Normal human serum may have its opsonic power for the Staphylococcus albus removed by the addition of a sufficient number of staphylococci in the cold (0° centigrade).

(2) Serum so treated may still have the power to reactivate a heated serum.

(3) Staphylococci may be treated with normal serum in the cold and then washed with cold salt solution without becoming much more susceptible to phagocytosis than they were before.

(4) Staphylococci so treated are much more easily opsonized by dilute normal serum or by serum which has been inactivated by contact with staphylococci in the cold than are the same bacteria untreated.

(5) These facts favor the amboceptor-complement theory for the structure of the opsonin, and may be explained by assuming that combination between amboceptor and bacterial cell takes place readily in the cold, while the union of complement is very slow or does not take place at all.

[We wish to express our thanks to the management of the Psychopathic Laboratory for the use of an *electric* centrifuge and to the Anatomical Department for the use of the cold storage vault (CO_2 process) which we have spoken of as "cold room."]

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[1] Bulloch and Atkin: "Proceedings of the Royal Society," LXXIV, 1904-5, 379.

[2] Dean: "Proceedings of the Royal Society," LXXIX, Series B, 1907, 899.

EDITORIAL COMMENT.

TIMELY DISCUSSION REGARDING TUBERCULOSIS.

Tuberculosis was the subject of discussion at the recent Buffalo meeting of the sanitary officers of the state of New York. Expert opinion was to the effect that the disease is increasing in the Empire state, and that a more liberal expenditure of state money will be necessary to bring about conditions for a reduction of the death rate from this cause. At present the mortality from tuberculosis is fourteen thousand annually, one-tenth of the entire death rate of the state. The cheapest and most effective means of treatment, in the opinion of Doctor John H. Pryor, late superintendent of the State Hospital for Incipient Tuberculosis, at Ray Brook, would be the establishment of a chain of sanatoria in the Adirondacks. Doctor Pryor declared that the disease in its early and curable stage is rarely recognized by physician or patient, and cited the fact that at present there is accommodation for fifty-five more patients at Ray Brook, the reason for the surplus of beds being that patients do not apply for treatment until the disease has progressed to an incurable stage. Doctor Edward T. Devine was of the opinion that for the care of persons who are dangerous to their families and neighbors and for the thousands who would enter hospitals were facilities adequate, local hospitals should be established throughout the state, and that there should be one such hospital for every 250,000 of the population.

SANITARY ADVANCES IN SOUTH AMERICA.

THE efforts of Doctor Oswaldo Cruz, Health Commissioner of Rio Janeiro, are tending toward the eradication of plague and tropical fevers from the metropolis of Brazil, and have transformed the beautiful harbor of the city from a sinkhole of pollution into one of the most disease-proof bodies of water in the world. Not only are these scientific precautions calculated to preserve the health of Brazilians, but once the fear of tropical disease is dispelled the countries of the southern hemisphere, with their rich resources, are destined to assume position with the foremost nations of the world. The question of health has long been a bugbear to northern settlers, who might well study the admirable methods of South American municipalities. In Rio Janeiro there is a bounty of five cents on every dead rat delivered to the authorities, with the street and number of the house in which the rodent was killed. The animals are subjected to bacteriologic examination, under direction of Doctor Cruz, and if plague is determined, the health squad, similar in organization to our fire companies, is dispatched to the scene to raze the interior walls of the infected structure and subject it to thorough disinfection.

ABE'S MEDIA FOR GROWING THE GONOCOCCUS.

THE apparent affinity of the gonococcus for the human body and the difficulty with which it is grown in artificial media has led many investigators to evolve specially prepared media, usually of highly nitrogenous character, for its cultivation. Wasserman and Thalman have experimented in this direction with fairly good result, but the media recently perfected by Abe seems calculated to supplant all others for gonococcic culture. Its reliability and ease of preparation, together with the rapidity with which the organisms multiply on its surface, especially commend it. Abe's method of preparation is to mix five hundred grams of fat-free meat, finely hashed, with one thousand grams of water. This is allowed to stand in an ice chest for from eighteen to twenty-four hours, after which it is filtered through paper and a Chamberland bougie into sterile containers. The fluid will withstand alterative changes for a reasonable time, and for use is mixed with either fluid or solid pepton media in the proportion of one to five.

ROCKEFELLER MUNIFICENCE AND MEDICAL RESEARCH.

THE sum of $2,600,000 has been donated by John D. Rockefeller to endow the Rockefeller Institute for Medical Research founded in New York City a few years ago. The gift will not only insure a continuance of the research work at this institution but will afford support for medical investigators engaged thereby throughout the world. At present the buildings at Sixty-sixth street and East River are entirely adequate, much floor space being available for future endeavor, but as the scope of the work increases the oil king will probably be called upon to extend the laboratory facilities. Indeed the need of a hospital wherein patients may be detained and the effect of remedies administered by research workers noted, is at present felt. Similar institutions in Europe find the hospital annex an indispensable feature. The present endowment will be utilized in the expense of management and salaries of the twenty workers comprising the staff.

MEDICAL NEWS.

A MEMORIAL BUILDING TO THE DISCOVERER OF THE TUBERCLE BACILLUS.

THE memory of Koch will be perpetuated in Germany by the erection of a research building, which will bear his name. Efforts are now being exerted in that country to collect sufficient funds for the completion and maintenance of the institution, the prime object of which will be the furtherance of research in the direction of discovering means to check the dissemination of tuberculosis. The edifice will serve as a permanent memorial to the discoverer of the tubercle bacillus, and will in many particulars be similar to the memorials to Pasteur in France and Lister in England. The officers of the committee delegated to collect funds are: Chairman, Doctor von Studt, Prussian State Minister; vice-president, Privy Councilor Althoff; secretary, Professor Schwalbe; and treasurer, Doctor vonSchwabach, S. Bleichröder's Bank, 63 Behrenstrasse, Berlin, to whom contributions may be addressed.

MINOR INTELLIGENCE.

ACCORDING to statistics compiled by Major Pilcher, editor of the *Military Surgeon*, there are in the United States and Canada 1,150 medical editors and associates.

DOCTOR THOMAS DE AMICIS, of Naples, Italy, was elected President of the next International Dermatological Congress, which will be held in Rome some time during 1910.

CHOLERA has made its appearance in Tokyo, Japan, nineteen cases being thus far recorded. In view of the overpopulation of the city and the crowded conditions of the poorer districts, the situation is said to be alarming.

DOCTOR RAY FERGUSON, Superintendent of the Arizona Territorial Asylum for the Insane, recently sustained serious injury in an encounter with one of his trusted patients. It is gratifying to know that, according to recent report, he is rapidly convalescing.

DOCTOR NEVILLE SOULE HOFF has been appointed acting dean of the Department of Dental Surgery of the University of Michigan, vice Doctor Cyrenus G. Darling, resigned.

THE conviction of a woman abortionist was recently secured by the Committee on Criminal Abortion of the Chicago Medical Society, and she has been sentenced to a term of twenty years in the state penitentiary.

ANNOUNCEMENT is made of the establishment of an institute for cancer research in Japan. A journal will be published by members of its staff and literature on cancer from English, French, and German journals will be reviewed.

THE fear of premature burial of a woman on the Continent was so great that, according to a European contemporary, she insisted on being interred with a loaded revolver in her hand, that she might immediately end her existence upon awakening.

HUBER, a European statistician, estimates that there are over 4,500 cases of lupus vulgaris in Hungary, the disease occurring with greatest frequency in individuals between eleven and twenty years of age. About fifty-eight per-cent of the affected are females.

BERTHA OSIS, who two months ago presented herself at the Massachusetts General Hospital for treatment, has been consigned to the leper colony at Penikese Island. Suspicion of leprosy by the attending physician was verified by repeated demonstration of the bacillus lepra.

THE death of Mrs. Margaret Horn at the New York Home for the Aged, in the one hundred second year of her age, removed a notable personage from the metropolis. She was born in County Cork, Ireland, in 1805, and survived her husband, who died at the age of one hundred three, twelve years.

SPANISH law requires mothers to refrain from work for a period of four weeks after childbirth, and factory managers are compelled to retain on the payroll women absent for this cause. Provision is likewise made for nursing the infant, time being allowed in the morning and afternoon for the purpose.

THE Austrian government has been petitioned by the Dentists' Association of Vienna, to restrain the Order of Brothers of Charity from tendering free dental treatment. The organization extracts more than 60,000 teeth annually, a needless sacrifice which should influence the authorities in favor of the dental practitioners.

AT the Sixth International Dermatological Congress Doctor William F. Breakey, of the University of Michigan, read a paper on "The Need for Higher Requirements in Examinations in Dermatology and Syphilology by Medical Colleges and Licensing Boards," with concurrent opinions from the principal colleges and examining boards of the country. This paper will appear in the next issue of this journal.

WHERE the number of cells is mentioned in "The Clinical Examination of the Cerebrospinal Fluid," which appeared in the September issue of this journal, read "per cubic millimeter" instead of "per cubic centimeter."

PROFESSOR ROBERT KOCH, who for a year and a half has been engaged in research work on sleeping sickness in East Africa, was honored recently by the Kaiser, who made him a "Wirklicher Geheimer Rat" with the title Excellency.

THE next International Congress of Tuberculosis will convene in Washington, District of Columbia, September 21, 1908, and continue its sessions until October 12. Doctor Lawrence F. Flick, of Philadelphia, Chairman of the American Committee, requests the aid of all physicians interested in the crusade against tuberculosis.

RECENT LITERATURE.

REVIEWS.

HARE'S THERAPEUTICS.*

THE twelfth edition maintains its universally acknowledged high position as a thoroughly up-to-date text-book for the medical student, and handy reference book for the practitioner in medicine. The volume is divided into two parts, one devoted to remedies in general, such as drugs, hygiene, and diet; the other to diseased conditions and their modern scientific treatment.

In both parts the subjects treated are arranged in alphabetical order, an arrangement that facilitates greatly the ease with which the book may be consulted, and adds immensely to the value of the book as a whole. The present edition has been revised throughout, and brought up to date in all particulars. To the person practicing medicine, and also to the person studying medicine, this work can be recommended without qualification. D. L. P.

*A Text-Book of Practical Therapeutics, with Especial Reference to the Application of Remedial Measures to Disease and their Employment upon a Rational Basis. By Hobart Amory Hare, M. D., B. Sc., Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia, Physician to the Jefferson Hospital, et cetera. New (twelfth) edition, enlarged and thoroughly revised to accord with the eighth decennial revision of the "United States Pharmacopœia." In one octavo volume of 939 pages, with 114 engravings and four colored plates. Cloth, $4.00, net; leather, $5.00, net; half morocco, $5.50, net. Lea Brothers & Company, Philadelphia and New York, 1907.

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ORIGINAL ARTICLES.

MEMOIRS.

TWO CASES OF CESAREAN SECTION FOLLOWING VENTROSUSPENSION OF THE UTERUS.*

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SINCE it was first advocated by Kelly, ventrosuspension of the uterus, as a cure for retrodisplacement, has been an exceedingly popular operation. Its technique is easy to acquire, its anatomic and symptomatic results are usually good, and it is applicable to all cases of retrodisplacement whether the uterus is freely movable or held by adhesions. To be sure, some of us who were doing a good many of these operations had quite a number of patients who complained of dysuria, suprapubic tenderness and pain, and who claimed they were no better after than before the operations. However, it must be admitted that these were the exceptional cases, for most of the patients were greatly benefited by the operation. Here and there a timid voice was raised against the procedure on the ground that it was very apt to be followed by dystocia, but for a long time such objections were given little heed. While conversant with the literature in which was detailed some of the serious accidents of pregnancy and labor which might follow suspension of the uterus to the abdominal wall, I was among those who neglected such warnings until brought face to face with the problem as presented by one of my own operative cases. Then and only then did I realize to what dangers I was subjecting the exceptional patient. One such lesson was sufficient, and since that time I have not performed ventrosuspension or fixation on a childbearing woman. The case which proved such an object lesson to me is as follows:

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*Read before the ANN ARBOR MEDICAL CLUB.

Case I.—Mrs. S., gynecologic number 542, age twenty-six, married, referred by Doctor Nelson Abbott, of Moorestown, Michigan, was admitted to the gynecologic clinic of the University of Michigan Hospital, May 25, 1903. Her menstruation began at the age of fourteen, had always been regular, and was unaccompanied by pain. She had been married a year and had aborted at the third month soon after her marriage. She was referred to the hospital for pain in the right lower pelvis and complained of a heavy bearing-down pain in the same region. On examination, the uterus was found displaced backward and the left ovary was enlarged and tender. The patient had a marked lumbosacral kyphosis. Although this condition was noted and accurately described on the examination chart, its importance as regards future pregnancies was evidently overlooked. June 5, 1903, the uterus was dilated and curetted, the left ovary and tube and the appendix removed. The uterus was suspended to the abdominal wall by passing two chromicized catgut sutures through the parietal peritoneum and posterior surface of the uterus about two centimeters below the fundus. The abdominal incision healed by first intention and the patient left the hospital June 30, 1903.

She reentered the hospital November 2, 1904, pregnant between eight and nine months. For some months she had suffered considerable drawing pain in the lower abdomen and had been generally uncomfortable. Examination showed a most peculiarly-shaped abdomen. As the patient lay upon her back the uterus rose abruptly from the pubes with a very marked suprapubic transverse fat fold. The fundus of the uterus was to the left and there was marked bulging in the flanks. The fetal head lay in the right flank, the occiput and back being anterior. The cervix lay high up in the pelvis and could be reached only with difficulty. The intercristal diameter was twenty-eight and the interspinous twenty-four centimeters. The ischial spines were only five centimeters apart. The sacrum was flattened out and backward, and it was impossible to reach the promontory. In others words, we had to do with a funnel-shaped pelvis with such a marked contraction of the outlet as to preclude all hope of delivery through the bony pelvis.

The patient started in labor a few hours after the examination and was immediately prepared for Cesarean section. At the operation, the uterus was found twisted toward the left, making it difficult to determine its median line. It was attached to the parietal peritoneum by a rather firm band of adhesions. Development had taken place in the posterior uterine wall to a marked extent. Just above the level of the cornua there was an actual protrusion of the thinned-out uterine wall, making a veritable hernia. As this area was some eight centimeters in diameter it became necessary to make the incision through this membrane-like wall, beneath which lay the placenta. The child was easily extracted by the feet. The uterus did not contract until stimulated with hot packs. Elastic ligature was used, catgut and silk ligatures for the uterine wall. The child was resuscitated without difficulty. The patient's convalescence was complicated by a right-sided attack of pleurisy and a left otitis media. The abdominal wound healed by first intention. Mother and child left hospital well December 8, 1904.

Although this case was complicated by a markedly contracted pelvic outlet, this really had little to do with the condition found at the operation. It made the decision in favor of Cesarean section imperative, but it in no way affected the position of the cervix or accounted for the extreme parchment-like thinness of the posterior uterine wall. If for no other reason, this remarkable thinning of the uterus was enough to decide me against the operation of suspension in the child-bearing woman. Rupture of the uterus would surely have resulted in this case because of the obstruction to labor presented by a contracted pelvis. I firmly believe it would have resulted in the absence of such obstruction, so thin was the uterine wall. According to Hurdon, rupture of the uterus has occurred in at least five cases following ventrofixation and suspension of the uterus. As might be expected in three of these cases, Menge's, Brodhead's, and Clark and Bowley's, the rupture was in the thinned-out posterior uterine wall.

Statistics show that dystocia is far more liable to follow fixation of the uterus to the parietal peritoneum, than it is suspension of the uterus. Still in a surprising large number of cases dystocia has become the sequel to ventrosuspension of the uterus. This is illustrated by the following case:

Case II.—Mrs. W., gynecologic number 2209, was operated upon at the clinic in March, 1902, for enlarged appendages and a backward displacement of the uterus. She was nineteen at the time, unmarried and had suffered for four years with pain in the right side. At the operation a hematoma of the right ovary, the size of a hen's egg, was removed and the uterus was suspended to the abdominal wall by the same method employed in the first case. The wound healed by first intention and she left the hospital April 19, 1902, with the uterus in good position. I saw the patient in July, 1906, in consultation with Doctor Conrad Georg, Jr. She was at that time six months pregnant and was suffering from abdominal pain and tenderness. While the cervix was somewhat backward and high in the pelvis, the uterus seemed to be rising normally in the abdomen. As far as the physical examination was concerned there seemed no reason for expecting the confinement to be abnormal, and expectant treatment was advised. In October, after a labor lasting some forty hours, the patient was delivered of a stillborn, ten and one-half pound child. The presentation was a breech and the child was extracted only with great difficulty. In January, 1907, the patient had a sudden profuse hemorrhage, which ceased after she passed some membranes. She consulted me the following July for amenorrhea and anemia. She was six months pregnant and complained of the same general abdominal pains and tenderness noted in the first pregnancy. Aside from the high position of the cervix and the tenderness and irritability of the uterus, physical examination was the same as at the first pregnancy. The patient was admitted to the University of Michigan Maternity September 7, 1907. The presentation at this time was a vertex, and the cervix was situated almost at the promontory of the sacrum and pointed backward. From September 15 to October 2 the patient had a miserable time of it. False pains and fainting spells were frequent. There were numerous attacks of nausea and vomiting, although the urine was negative.

Pains began in good earnest at 6 A. M. October 2. The contractions for the next twenty-four hours were every five or ten minutes, but totally ineffectual. The fainting attacks became more frequent, and the patient at times was drowsy and hard to rouse. Examination October 3 showed the pulse to be about 110 and quite irregular. The cervix was not even taken up, and apparently nothing had been accomplished by the regular pains of the previous twenty-four hours. Cesarean section was performed at 10 A. M. The uterus was found attached to the anterior abdominal wall by a strong, cord-like band of adhesions about the size of a lead pencil, extending from a point about four centimeters to the right of the median line of the fundus and running to the anterior abdominal wall about four centimeters above the symphysis. This band of adhesions was clamped and cut. The uterus had rotated so that the anterior median line lay over toward the left, bringing the right uterine artery anterior. The gravid uterus was rotated toward the right as near as possible into its normal position and pressed forward so that it presented the fundus through the abdominal incision. A five centimeter incision was made from the fundus downward as near the median line as possible. The placenta lay anterior. The six-pound child was easily extracted and resuscitated after somewhat prolonged stimulation. The uterus did not contract well and the rather free oozing was controlled by compressing the broad ligaments and the uterine arteries. Both mother and child left the hospital well October 30, 1907.

In the first case, while the uterus was not exactly fixed to the parietal peritoneum, the bands of adhesions were shorter and not so cord-like as in the second case. In the latter, there existed a typical long band the size of a lead pencil and attached four centimeters to the right of the median line of the uterus. The extreme length of this band had allowed more upward development with less thinning of the posterior uterine wall than in the first case, where the uterine attachments were shorter. But a twisting of the uterus resulted, which in itself probably was one of the causes of the inefficiency of the pains.

Andrews calls attention to the comparative frequency of asymmetry or torsion of the uterus following ventrofixation and suspension of the uterus. It was noted at least five times, and in three of these cases Cesarean section was performed. The torsion may increase the difficulties of the latter operation, for the uterus may present its lateral border to the operator's hand after the abdomen is opened. A cut in this location would surely give rise to considerable hemorrhage, as it would be likely to sever the uterine artery. In my second case it proved impossible to rotate the uterus in the opposite direction until after the suspending band had been cut.

A high position of the cervix is quite a common occurrence in pregnancy following abdominal suspension operations. It was present in both the above cases, perhaps in a rather more marked degree in the first than in the second case. It was noted in eleven per cent of Andrews' cases, and the cervix was near the level of the promontory in eighteen of the twenty-one cases of Cesarean section following ventrosuspension operations collected by Lynch. This high position of the cervix and the direction in which the external os points is the cause of the dystocia in many cases. In some of the cases it was impossible or only just possible to reach the cervix even after the patient was anesthetized and the hand carried into the vagina. Again, the position and direction of the cervix makes version difficult and at times impossible. In a way this is fortunate, for version in the presence of a thinned-out posterior uterine wall is extremely hazardous because of the danger of rupture of the uterus. When the cervix is situated high in the pelvis and backwards, vaginal Cesarean section is contraindicated. I cannot imagine a more difficult operation under these circumstances.

When the fundus is fixed and the upward development of the anterior wall is impaired, there is a tumor-like mass formed by the hypertrophied anterior wall below the point of fixation. This mass may project over the brim of the pelvis and may even obstruct delivery. Williams, Noble, Martin, Clark and Bowley, Gibert and Hurdon especially note this condition. It was absent in my two cases, probably because the attachments of the fundus to the parietal peritoneum were not firm enough.

Malpositions of the fetus after abdominal fixation of the uterus are quite common. For instance, transverse positions were noted in fifteen out of twenty-one cases of Cesarean section reported by Lynch. These abnormal positions are evidently brought about by the distortion of the uterus due to interference with its free upward development. In my first case the fetus lay transversely, in the second case, while the position was a vertex just before the performance of the Cesarean section, the patient gave a history of having had a breech in her former labor.

Hurdon has collected thirty-six cases of Cesarean section performed for dystocia following ventrofixation, with a maternal mortality of thirty-four per cent and a fetal mortality of forty-four per cent. Such statistics are a serious arraignment of the operation in this class of cases, if the figures are taken at their face value. But study of the cases shows that the high mortality is due, not so much to the method of treatment, as to the fact that the patients had been rendered septic prior to the Cesarean sections by futile attempts at delivery through the natural passages. Lynch concludes from a study of his own case and twenty additional cases of Cesarean section for dystocia following ventrofixation of the uterus, that the best results can be obtained by resorting to the section at the onset of labor, and without any attempt at delivery through the natural passages. I am in perfect accord with this conclusion, and so acted in my last case. In the first case there was no alternative except Cesarean section, because of the marked contraction of the pelvic outlet.

Laparotomy followed by separation of the adhesions at term before or after the onset of labor is advocated by Hurdon, who reports two successful cases. There have been five such cases with no maternal mortality and the death of two infants. She would except cases where the pelvic measurements are much below the normal, or where the whole anterior surface of the uterus is so densely adherent that its separation would leave a wide defect in the surface of the uterus. Circumstances and the operator's skill and experience will be determining factors in the choice between these two procedures. In my second case freeing of the adhesions might have been followed by uterine adjustment and natural labor, but I have my doubts whether the weakened uterine wall would have so responded.

But better than all methods of treatment is prophylaxis. The fact that one never can say definitely that a woman will be free from serious dystocia should she become pregnant after ventrofixation or ventrosuspension, is enough to condemn the operation in the eyes of the conscientious surgeon. Fortunately, we have at the present time other equally efficacious and far safer operations for backward displacements of the uterus. Personally I find that shortening the round ligaments through a single incision answers every purpose. In my hands it has entirely superceded ventrosuspension.

Ann Arbor, 1416 Hill Street.

PROSTATITIS.

C. MELVIN HARPSTER, PH. G., M. D.

DIAGNOSIS.

THE normal secretion of the prostate is a thin, turbid fluid of watery consistency (not ropy or sticky as in the diseased prostate), of slight acid reaction, and of seminal odor. Under the microscope it is seen to contain epithelia from the prostatic gland and phosphatic crystals. Böttcher's crystals are rarely seen in normal prostatic juice but are usually found in diseased prostatic juice, with semen, which is a valuable diagnostic point whether a secretion is from the seminal vesicles or the prostate. These crystals are dagger- or cuttle-fish-shaped, large, colorless, and transparent, and are found in sheaf-like clusters. No authentic cases in sufficient numbers exist to warrant us in saying these crystals are found in the testicle. By adding ammonium phosphate to any semen (a one per cent solution) these crystals can be produced.

The ejaculatory ducts begin at the junction of the vas deferens and seminal vesicle. Becoming smaller and of even calibre these ducts run obliquely forward and upward through the prostate, approaching each other until they nearly touch in the median line. Yet they are quite separate to their openings on the lips of the prostatic utricle. The functions of the seminal vesicle are three: (1) To store the secretion of the testis; (2) To dilute it; (3) To expel it into the prostatic sinus just before ejaculation.

It is well to understand that we may have an enlarged prostate either acute or chronic, or, as is sometimes classified, acute, subacute, or chronic, entirely distinct and separate from that enlargement known as senile hypertrophy of the prostate. Today we recognize in gonorrhea an infection which has invaded every tissue of the human body. It is the most widespread and universal disease affecting the adult male population. Not all cases of enlarged or inflamed prostate produce obstruction. Not all cases of obstruction are produced by prostatic enlargement or outgrowth. It is impossible to tell such a condition by palpating per rectum only. The advent of the endoscope and cystoscope and its scientific application to diseases of the urethra and bladder opened a new and interesting field to the practitioner in this class of diseases because it gave the surgeon an opportunity to examine and study the pathologic conditions which obtained in the deeper portion of the prostatic urethra and bladder.

I shall take up for our consideration those enlargements of this interesting gland, which at times is a sexual organ and at other times becomes very much a urinary organ. First, those malignant conditions, cancer and sarcoma.

As these are fortunately rare an extended review will not be required. Tauchon's statistics show five cases of prostatic cancer in 8,289 collected cases of cancer. Malignant growths are not often recognized until the disease is well advanced. It occurs late in life; and both by the patient and the surgeon the condition is often supposed to be senile hypertrophy of the gland. The progress is furious and the pelvis is often filled with the growth before its true nature is detected. In children obstruction is the initial symptom, and sarcoma the growth. In the adult pain is the first symptom; at first only during urination, it soon, however, becomes continuous. Pain is increased on defecation and urination. It is severest in the perineum and radiates to the genitals, limbs, et cetera. Keyes says "bilateral sciatica is especially suggestive of cancer of the prostate." Hematuria before or after urination, and towards the end of the disease, constant straining, foul urine, edema of genitals and extremities, cancerous cachexia, et cetera, are indicative of the disease.

The use of the cystoscope cannot be too early recommended in these painful and fatal conditions. By rectal palpation the diagnosis can be made but usually not early enough to be of avail. In a pronounced case the cachectic condition, the dysuria, the foul, bloody urine, the enlarged inguinal glands only require a slight rectal examination to confirm the diagnosis. The finger will immediately detect the nodular, hard tumor. The diagnosis between simple and malignant hypertrophy is often impossible in the primary stages of these diseases. An intravesical growth can always be absolutely determined with the cystoscope, but it is more difficult to map out a prostatic growth. If one wishes to divide the circle on the ocular end of a cystoscope into equal parts to facilitate the diagnosis this can be done. When a large, ill-defined tumor is felt through the rectal wall, and the prostate can be also made out, we have a cancer of the bladder wall or pericystitis to deal with. If the prostate is involved in the disease, and the mass is apparently fast to each side of the pelvis and extends upward indefinitely, there is a question as to cancer or periprostatitis. But if the finger can be swept across the tumor and into a deep sulcus on each side, malignant growth is very suggestive. But in some cases all the signs and symptoms are those of hypertrophy until the rapid advance of the disease betokens its malignant nature.

Cancers are medullary or adenocarcinoma. An interesting point called to the attention of the profession by the writer a number of years ago in the *Lancet-Clinic,* is the shape of the feces in patients suffering from enlarged prostate. In cases where the enlargement projects into the rectum the fecal mass will show an indentation on the side of the mass corresponding to the pressure. Dribbling of urine during defecation is diagnostic of an enlarged prostate. During the sexual act this organ acts as a muscle, a sensory organ and a gland. Wolbarst says: "To briefly consider the prostate as an urinary organ is both essential and necessary in giving its symptomatology." It is commonly spoken of and thought of as a purely procreative organ—an important member of the sexual family of organs. It has been termed the sexual heart, and when we consider its physiologic function the name seems certainly deserved.

The urethra, carrying the urine from its reservoir, the bladder, into the outer space, tunnels its way between the two prostatic lobes, its walls, roof and floor being made up of prostatic tissue. This portion of the urethral tract, known as the prostatic urethra, or wrongly called the neck of the bladder, is about one and one-quarter inches long. The opinion expressed by Keyes to the effect that "the prostate has nothing to do with urination, and is quite passive in the act," is the usually accepted opinion. In infants these fibres are continuous with the fibres of the bladder walls. The line drawn between the bladder and the prostatic urethra is an imaginary one. It does not exist automatically, neither is there good reason for believing that it exists physiologically.

The prostatic urethra opens into the bladder like a funnel, the wide mouth facing the bladder, the narrow mouth being continuous with the urethra anteriorly. For all purposes the wide mouth of the prostatic urethra is a continuation of the urethra and is always involved with diseases of the prostate. The bladder cannot long remain free from involvement if the prostate is diseased, and vice versa. This is well illustrated by the picture presented by an acute inflammation of the prostatic urethra, and the condition is usually diagnosed as bladder inflammation. The importance of the organ in health practically depends on its genital functions. It may functionate as a genital organ, and at the same time be responsible for many urinary conditions, dangerous to life itself. The prostatic urethra leads not only to the bladder, but to the deep genital organs. In acute and chronic gonorrhea the role of the prostate is a dominating one. In the end chronic gonorrhea is gonorrhea of the prostatic urethra and stricture. The acute form may limit itself to the surface of the prostate, or may infect its follicles, it may reach the highest degree of inflammation and lead to abscess formation. Between these extremes every degree of inflammation is possible, and the degree of the inflammation is reflected and made manifest by the urinary symptoms which follow. Frequent, urgent and painful urination and vesical tenesmus to a greater or less degree; in severe cases the prostate, by its large size, may offer a mechanical obstruction to the flow of urine, becoming more and more marked, and sometimes absolute retention. The urinary symptoms are in direct proportion to the extent of the prostatic inflammation. In chronic inflammation the symptoms are subdued, in sympathy with the low character of the inflammation.

It is unfortunate that the relations of the prostate to gonorrhea are so often overlooked. Examinations of the prostate in gonorrheal cases should be frequent, and especially before a patient is discharged as cured. The gonorrheal patient is dependent for relief upon the treatment of his prostate and a proper diagnosis. Prostatitis must be excluded from contracture of the neck of the bladder, tuberculosis, atrophy, malignant or benign tumors, cystitis, periprostatitis, seminal vesiculitis, urethorrhea, prostatorrhea, spermatorrhea and cowperitis. It is diagnosed from cystitis by the greater degree of constitutional disturbance, general febrile reaction being a much more common attendant of prostatitis than of cystitis. The pain is more of a throbbing and bearing down character in prostatitis, and is chiefly confined to the perineum and is less prone to radiate. In prostatitis the finger introduced per anum will detect the swollen and sensitive gland, while in cystitis, although the introduction of the finger may be painful, no swelling is encountered. On passing a catheter an obstruction is usually met with in the prostatic urethra, and when it enters the bladder a large amount of urine escapes. In cystitis the bladder is nearly empty, since the extreme irritability of its walls does not permit any large collection of urine.

METHODS OF EXAMINATION OF THE PROSTATE GLAND.

(1) By rectal palpation, which is important. The bladder should be moderately full. The best position is to have the patient face a table or desk, with his left knee on the seat of a chair, and instruct him to lean well over the table. The dorsal position is often used. As soon as the finger has passed the internal sphincter it enters a pouch, upon the anterior wall of which is felt the membranous urethra for half an inch, then the prostate. The normal prostate is but faintly perceptible as a heart-shaped body one and one-half inches long, with its apex downward. Above each lobe of the prostate lie the seminal vesicles, which if healthy cannot usually be felt. The so-called massage of the prostate is accomplished by pressing with the finger firmly but forcibly against the extreme upper point of one of the lobes, is carried slowly towards the apex with a to-and-fro motion, all the while making firm pressure on the gland. This is repeated several times on each side. To reach the seminal vesicles counter pressure on the abdomen must often be made.

(2) The urethral length is the distance a catheter must travel before drawing any urine. The urethra varies from six and one-half to nine inches long. In the great majority of cases the length of the urethra, estimated by the distance at which the urine begins and ceases to flow when a catheter is pushed in and out, is between seven and one-half to eight and one-half inches. Any increase in this distance indicates that the prostate is enlarged.

(3) If a stone searcher or small sound is introduced into the bladder and drawn tightly up against the neck of that organ, the prostate may be mopped out between the instrument and the finger in the rectum.

ACUTE PROSTATITIS.

This condition may be due to violence from sounds, catheters or instruments; to the application of irritants to the deeper portions of the urethra; to stricture; to the irritation of a stone in the bladder; to excessive purgation; to immoderate coitus; but by far the most frequent cause is gonorrhea. The accessory causes of the last-mentioned disease are highly irritant injections, forcible distention of the urethra in using a syringe, excessive exercise, alcoholic stimulants, exposure to wet and cold, and excessive venery.

The earliest symptom is the sensation of weight and a dull pain in the perineum. There is not that vesical tenesmus which we find in cystitis, the stream of urine is generally quite small, and is often only forced out by a prolonged straining, and excites a severe scalding in the posterior urethra. Complete retention of urine often occurs. The bowels are commonly constipated, although the patient is constantly led by a feeling of fullness in the rectum to make fruitless efforts at stool.

Acute prostatitis may terminate in resolution, in suppuration, and in rare cases in gangrene. A number of cases are reported, and I have had one in my own practice where death ensued from peritonitis due to the extension of the inflammation.

The formation of pus must be looked for if the disease has been increasing in intensity for a few days and the patient is seized with chills followed by fever and general depression. Occasionally an abscess forms without affording the least reason to suspect it. The abscess usually breaks upon the side of the urethra, or it may break into the rectum, bladder, or cellular tissues of the pelvis. In one of my cases, on passing a soft rubber catheter to wash out the bladder, on withdrawing the catheter it was followed by a copious discharge of pus, the abscess having been ruptured. I have seen a case where ruptures occurred in both bladder and rectum, leaving a urethrorectal fistula. Pericystitis and periprostatitis is always an extension into the cellular tissue from an inflamed prostate.

CHRONIC PROSTATITIS.

Doctor Gross, of Philadelphia, was the first American to call attention to this condition. His paper was published in the *North American Medical Clinic Review,* July, 1860. It is most common in young or middle-aged men. The most frequent and prominent symptom is a discharge of a clear, transparent or sometimes turbid mucus from the meatus, which under the microscope consists of crystals, mucus corpuscles, blood disks, and epithelium cells with or without pus. The discharge may be almost constant, or more frequently is forced from the urethra during straining at stool, or again only a drop will be noticed in the morning on arising. Frequency of urination is usually marked, the stream is ejected without force, and the last drops often dribble away, or are only expelled with considerable effort; a scalding sensation is felt along the canal after urination. Pain and uneasy sensations are experienced in the perineum, thighs and lumbosacral region, the bowels are constipated, and defacation is difficult and painful. A sound passed through the prostatic region causes severe pain. On examination per rectum the gland is usually tumefied, sensitive, and sometimes indurated.

The patient is irritable and low spirited, and usually watches his case with great anxiety. Chronic prostatitis never terminates in suppuration or abscess, and rarely in chronic hypertrophy so common in old men. An occasional case may be seen, however, where the one physical sign may be absent, but this is exceedingly rare. While it is possible at some stage of the disease for all the symptoms to subside except the swelling, the characteristic symptoms will again appear unless the condition is relieved by appropriate treatment.

One of the foremost evidences of prostatitis is premature emission of the semen, which is attended with marked congestion and hyperemia of the prostatic portion of the urethra, swelling and inflammation of the colliculus seminalis, together with engorgement and congestion of the openings of the ejaculatory ducts. The Germans have shown that a large proportion of these cases were sufferers from chronic gonorrhea. A congested and granular condition of the mucous membranes of this portion of the urethral tract was present, attended with more or less puffiness of the mucous membrane, which was, however, not tight enough to be considered a stricture, although the endoscope distinctly showed that the lumen of the canal was somewhat constricted from its normal proportions. It must be borne in mind, however, that there are certain normal constrictions in the male urethra, the first of which is at the commencement of the true urethra, and is situated at the posterior portion of the fossa glandis; the second is at the parts membranacea.

The prostatic portion of the urethra, on the other hand, is one of the dilated parts of the canal. For convenience we speak of the neck of the bladder, but in reality there is no neck. It is the prostatic urethra which extends from the circular fibres at the mouth of the bladder as far as the membranous portion of the urethra, and is more or less encircled by the prostate.

Occasionally a real or organized stricture will, particularly if seated far back in the region of the so-called bulb, produce premature emissions, and must of course be diagnosed from prostatitis for this symptom to be of value.

An acute hypertrophy of the prostate, of inflammatory origin, produces absolute impotence, is almost always associated with a discharge, et cetera. This discharge may be carelessly called gonorrheal, but every urethral discharge cannot be accepted as gonorrheal, prostatic or nonprostatic without making a careful microscopic examination of the discharge for the presence or absence of the gonococcus, or of the so-called Boettcher's crystals, which procedure will decide the character of any discharge. And in this connection I wish to remind you that a discharge may also occur from the glands of the urethra, known as urethorrhea, in which there are no gonococci or so-called prostatic crystals, which is almost negative in character, save and except for an occasional epithelial cell, usually of the broad or pavement kind.

There are two varieties of discharge which come from the prostate. One known as prostatorrhea, which is noninflammatory, and the other, which is really the discharge, will be described in full. The presence of albumin or albumose in the urine voided after massage of the prostate, when that passed before the massage is normal, is as diagnostic of prostatitis (or, which is rare, an abscess draining into the urethra) as renal albumin is in the diagnosis of kidney disease.

This is constantly found in patients with inflamed and swollen prostates. In acute inflammations the urine for a few days shows as much as one per cent of proteid. The recognition of this prostatic and vesicular proteid affords a very simple method of making a positive diagnosis of prostatitis, and, when in great excess, seminal vesiculitis.

A study of these secretions has led Ballenger to the conclusion that spermatorrhea, instead of being a neurosis as usually stated, is really a low grade of inflammation of the seminal ducts and vesicles and the ampullations of the vas deferens, and should be borne in mind. The inflammation causes an increase in the secretion which mechanically unites with the spermatozoa.

Seminal vesiculitis always accompanies prostatitis. The vesicles can be felt per rectum. The finger passing beyond the prostate feels a boggy, soft, fluctuating, elongated, sausage-like mass very tender, which is the inflamed vesicles. A distended bladder and counter pressure on the abdomen will greatly facilitate the examination. An enlarged vesicle may be cancerous or tubercular or cystic, but the great majority are enlarged from inflammation. With an enlarged prostate the inconvenience will be first noticed at night, while with a stricture it is more noticeable at first during the day.

Posterior urethritis is usually accompanied with a gleety discharge, but the prostate and vesicles feel normal to the touch and by this are differentiated from posterior urethritis, but primarily and alone the disease is rare.

Prostatorrhea is a sexual malady due to a strain. The discharge (generally acid) is thin, watery, white, milky, not sticky or soapy to the feel. It contains prostatic bodies and does not contain Bœttcher's crystals. This condition rarely occurs without seminal vesiculitis.

Spermatorrhea is a condition in which semen is found in the discharge.

Cowperitis, on palpation of the perineum, is a condition which can be easily told.

Senile hypertrophy retards the urinary flow. Without an enlargement we can have no obstructive symptoms. The one danger is obstruction. The prostate assumes a pathologic enlargement, pressing on the floor of the prostatic urethra or of the bladder at its junction with the latter, thereby lessening the lumen of the canal. Interference with urination follows, and the result is a number of urinary symptoms so aptly put by Wolbarst: "Obstruction, retention, congestion, distention, inflammation, atony, sepsis, death." Either muscular, glandular or connective tissue elements predominate, thereby determining the extent of the interference with the urinary system. It is well, however, to bear in mind that the extent of the enlargement does not determine the subjective symptoms, but the manner in which the enlargement impinges upon the lumen of the urethra. Thus the hypertrophy may be very large, in the direction of the rectum, without interfering to the least extent with urination; on the other hand, a small growth or bar pointing directly into the so-called bladder neck may so obstruct the stream as to cause complete retention.

It is apt to be irregularly enlarged when pointing toward the urethra or bladder, while in the direction of the rectum it is a smooth and an even mass usually. Examination of the prostate by rectum is therefore not conclusive as to the extent or character of the urinary obstruction. A prostate that feels normal to the finger in the rectum may occlude the prostatic channel completely, and vice versa.

Chronic contracture of the neck of the bladder is often mistaken for prostatic hypertrophy or prostatitis. The lumen of the canal is narrowed and obstruction to the urinary flow is more or less well marked. The bladder pouches and cannot expel its contents. The residual urine behaves like that of prostatic obstruction and presents the same symptoms. Diagnosis can be made by exclusion. It has no clinical type by which it may be constantly identified. While it doubtless often passes unrecognized, and is in its milder form curable, it can only be identified clinically under one of three forms. In each case it is a stubborn and unmanageable condition. It usually occurs as the result of a protracted chronic urethritis. The contracture often prevents the cure of the posterior urethritis—a protracted posterior urethritis that does not yield to any local or general treatment, imperative urination, and some pain during and after urination, a pain which is the more notable since there is no acute inflammation to account for it.

A contracted neck of the bladder is often met with in long standing cases of vesical calculus. The obstruction is often in the form of a bar at the neck of the bladder. This variety of contracture covers a multitude of misinterpreted cases, as cases of atrophy of the prostate with the retention and other symptoms of hypertrophy, as cases of so-called hypertrophy occurring early in life. All these obscure forms of retention, wrongly ascribed to hypertrophy of the prostate, are due to contracture of the bladder neck, and can be diagnosed absolutely with the cystoscope. However, contracture and hypertrophy may both exist at one time. Where the urinary distance is not over twenty cubic millimeters and there is retention of urine contracture of the vesical neck is present, where no prostatic enlargement is diagnosed. Where in any given case that presents the classic symptoms of urinary obstruction, it is found on examination that the hypertrophy of the prostate, if there be any, is not sufficient to account for the residuum, and there is no increase in the urinary length, we may, with reason, assume that chronic contracture exists. We may also diagnose this condition where the patient complains of painful and frequent micturition in the course of an obstinate chronic gonorrhea, without the presence of acute inflammation, and where residual urine can be found without prostatic hypertrophy. In neuralgia of the prostatic urethra we have a condition known as irritable or sensitive bladder, which is the result of irritation of the deep urethra, modified either way by the nervous condition of the patient. Nocturnal urination is rarely present. The urine is clear, though highly phosphatic. Neurasthenia is usually manifested. Atrophy is caused by contracture of the neck of the bladder and is an uncommon condition. Physiologic atrophy occurs in a small per cent of old men. Prostatic atrophy is too rare to call for comment or discussion. Tuberculosis is sometimes present. The symptoms are like those of any chronic inflammation of the gland. Hematuria is sometimes present. The symptoms depend on the severity of the disease. Objectively, the prostate is enlarged in an irregular manner, with softened areas. In extreme cases the entire gland is a cheesy mass. Extension from the bladder cannot take place without involvement of the prostate. Bacilli found in the urine and the fact that the condition is nearly always secondary will clear up the diagnosis. Calculi of the prostate are vesical stones that have passed from the bladder and lodged in the prostatic urethra, or as prostatic concretions, in which case they consist of phosphate of lime and epithelial waste. Clinical symptoms are rare. They work their way backward or forward. Here we see how the prostate may be responsible for a vesical calculus.

The treatment of prostatitis (acute) is similar to any acute inflammatory condition elsewhere in the body. Abandon the use of all injections. Mild irrigations through a soft catheter, tied in to do away with frequent introductions of the same. Perfect rest in bed. Large amounts of water. Mild mucilaginous drinks. Hot hip baths. Cold or hot douches per rectum.

Where suppuration has ensued make free perineal incision and drainage of abscess, or if the fluctuation is pointing toward the rectal wall and the abscess is small incision per rectum is the best. Any drug that will increase the amount of urine without irritation will be useful.

The chronic condition requires great patience on the part of the surgeon, and every case can be cured by the proper passage of sounds, massage and installation of some of the silver salts. I usually fill the bladder with a mild solution of nitrate of silver after the canal has been dilated with sounds, and massage the gland. After the massage the patient is instructed to urinate, thus carrying out all the expressed secretions. By this method every portion of the tract is permeated with the solution. This condition is very intractable and is usually complicated by some of the other conditions in this region, as posterior urethritis, vesiculitis, contracture of the bladder neck, cystitis, et cetera. Four plans are in vogue at present:

(1) Rectal douches and prostatic massage.
(2) General tonic treatment and irrigation (urethral).
(3) Perineal cystotomy.
(4) Vasectomy.

The third and fourth plans should be reserved for those cases that will not yield by the other plans.

Vasectomy has been revived and used by a number of operators, especially Lydston. By tying off the vas in these cases the inflammation seems to expend its force in the testicle and epididymis, and a cure results. Keyes says he knows of no explanation of this phenomenon.

Lydston says, in *Journal of the American Medical Association*, July 21, 1906, that its beneficial effects are due not only to the change which it produces in the circulation and innervation of the prostate, but also to the rest which it secures to the seminal vesicles. The divided ends can at some future time be anastomosed and the function again restored. One case in my hands has resulted in a complete recovery. Where contracture of the neck of the bladder is present, perineal section with drainage is the method of choice.

In senile hypertrophy, a prostatectomy, performed as soon as the symptoms of obstruction begin to appear, offers the patient a better chance for help, comfort and prolongation of life than the patient who leads a catheter life. Horwitz says experience proves that the patients of the latter class eventually succumb to one or the other sequela attendant on this method of treatment. I advocate early operation in both private and hospital practice. By adhering to this rule, cases that will ultimately require an operation will be recognized early and permanently relieved with comparatively little risk. No effort has as yet been made to classify cases according to age and length of time patient has suffered from the disease. Only two methods are in favor today, prostatotomy (Bottini) and prostatectomy (suprapubic or perineal).

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THE NEED FOR HIGHER REQUIREMENTS IN EXAMINATIONS IN DERMATOLOGY AND SYPHILOLOGY BY MEDICAL COLLEGES AND LICENSING BOARDS.*

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A CONSIDERATION of the subject of the above title was undertaken with the belief that the need exists for higher requirements in examinations in dermatology and syphilology, in our country at least, and could be convincingly shown by data from records of curricula of some teaching colleges and examining boards for license to practice medicine; and that the occasion was timely for presentation before an international body of eminent dermatologists, whose opinions whether in approval or disapproval would carry weight, with teaching and licensing bodies in the professional world.

I should further add, in view of the incomplete analysis and arrangement of facts secured, that I had the mistaken notion that I could procure and collate data with less labor in the time at my disposal than would be necessary for the preparation of a scientific paper. In this I greatly underestimated the number and volume and work of abstracting replies and catalogues received from over forty medical colleges, and about the same number of examining boards in medicine, in response to inquiries concerning hours given to teaching students, methods of instruction, et cetera, and time and space, number and character of questions, as compared with other specialties in medicine, given by examiners to candidates for license.

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Before sending out these inquiries, I had the belief that the colleges, with few exceptions, were more delinquent in the time given to instruction in these subjects. But the calendars and schedules, together with the replies from colleges, and examining boards show that my belief was not well founded. A very large majority of examiners admit responsibility for more or less neglect of these subjects, most of the writers adding the opinion that diseases of the skin and syphilis should receive more consideration. The reason given by some examiners that the State law establishing their boards does not specify these subjects, does not seem a sufficient explanation, as many other specialties are scheduled for examination as subdivisions of the general heads, named in the organic law; and some examiners state that questions pertinent to dermatology and syphilology are asked under general practice and general surgery.

It does not follow that there must be separate heads for questions on these diseases. Where the schedule comprises but eight or ten heads, questions on these subjects, like other special subjects, can be given under subdivisions of general medicine and surgery. Though where twenty or more heads are published on examination schedule, the inference would be that these contain all the special subjects on which examinations will be made. And there would seem to be room for such mention of dermatology and syphilology on official blanks that the applicant for license would see that they are included in the examinations. It is not so material what the reasons are; the purpose is to encourage higher and more uniform requirements. It is in no spirit of hypercriticism, but to secure facts and call more general attention to conditions for which we are all more or less responsible.

A full consideration of this question of more time, it must be conceded, may lead to similar claims for other specialties, both in teaching and examinations, and logically to lengthened courses; all of which is likely to come in the not very distant future. But the immediate question is, whether a disproportion exists in the number and character of cases of disease of skin, and of some other special fields of medicine, and the implied importance as shown by space and time given each in college curricula and examination schedules.

If dermatology as a specialty in medicine was maintained only for the benefit of dermatologists, and they were mercenary, they should not complain. But as medical science is cultivated for the general good of the race, rather than for physicians, it is obvious that whatever adds to more general diffusion of all practicable medical knowledge, especially such as may be needed in emergencies, should be required by teaching and examining bodies authorized to confer degrees and to license practitioners. It will be conceded that it is essential that the physician be able to diagnose the exanthemata, to protect the public by advising quarantine when needed, and to avoid panic; yet to do this it is necessary to differentiate from them, the various forms of erythema, dermatitis and syphilis. The gravity and often unsuspected presence of the latter, make it of the utmost importance to the individual, to the family, and to the public, that a correct diagnosis be made and appropriate treatment carried out. In view of the awakened public and professional interest in this phase of the so-called social evil, it is fitting that rational scientific medicine should do its work, and receive its proper recognition in enlightening the public upon the enormity of this evil, and in rescuing its unfortunate vctims from the associated and but slightly lesser evils of quackery and imposture.

I should be glad to credit the quotations I make from replies, to their authors, but my circular letters stated that the name of college or examining board would not be used without authority. And while the name of the writers in some cases who would not object to being known, would lend greater weight, I do not feel at liberty to vary from conditions offered. I wish, however, to make acknowledgment of the courtesy and kindness of the writers. These extracts from letters, both from colleges and examining boards, represent opinions of men covering wide territory and in position to estimate the situation in the field, and impress me as entitled to much consideration. I have not had time to secure reports from enough European colleges to make fair comparison. The replies from about forty American colleges, including the most prominent, furnish some interesting data and show that with a few exceptions, a fair amount of time is given to instruction in diseases of the skin and syphilis. Fifteen give instruction in both third and fourth year lectures, recitations, quizzes and clinics. Ten give instruction as part of combined course in genitourinary, venereal, and diseases of skin. Four or five have no separate course, teaching dermatology in a few incidental lectures with general medicine, and syphilis with surgery. Five give only one hour a week; but most of those reporting range from two to four hours a week, and a few including recitations in sections and hospital work, count six hours or more for part of the term. A large majority exceed the forty hours recommended by the Association of American Colleges.

The following extracts from letters without classification serve to show the plans of teaching in different colleges.

The secretary of a Canadian province college says: "We have no special course in dermatology or syphilology. A special skin clinic is held at the hospital once a week for the final students. There are also didactic lectures on the subject, but these are not extensive. The work in syphilology is done partly in the course in surgery."

The secretary of one of the oldest medical colleges in the south, which gives thirty-four hours didactic and sixteen clinical in dermatology in the junior year and nearly an equal number to syphilology in connection with genitourinary and venereal diseases, adds: "I am personally of the opinion that both of these subjects are of great importance to the general practitioner, and that in the past an insufficient amount of time has been devoted to the teaching of them."

The secretary of a Pacific coast college that gives one hour in the junior year and three in the senior year, says: "I believe our students get enough work as to syphilis, but might with advantage get more in dermatology, but it seems hard to find time for more in this line. There can be no doubt as to the needs of the general practitioner for more knowledge, especially of dermatology. The average doctor feels that he knows but very little about it, and the only way to overcome this, in my judgment, is to insist on more clinical work in that line."

The dean of a New England college writes: "We follow the hours adopted by the Association of American Colleges, twenty for lectures and quizzes, and twenty for clinical work, beside time given to these subjects in hospital and dispensaries. I believe in higher requirements in these and many other subjects."

Another New England college writes: "The importance of full diagnostic and therapeutic knowledge of these subjects cannot be overestimated. We are trying to do as well as we can under our limitations."

One of the oldest New England colleges, which gives one-thirty-fourth of the required time of the junior year and one-twenty-first of the required time of the senior year to these subjects, says the subjects mentioned are of the utmost importance to the general practitioner. He thinks the number of hours devoted to these branches is soon to be increased.

The dean of an old college where both subjects are taught in the senior year, and constitute about four per cent of the total number of required hours in the year, adds: "There can be no question as to the importance of these subjects to the general practitioner, but unless the medical courses are lengthened to five years, it will be difficult to devote more time to these specialties during the regular curriculum."

The secretary of an interior western college says: "It seems to me that it would be better to provide optional courses in addition to the required work in a number of special subjects."

Another western college writes: "The general practitioner should especially acquaint himself with all syphilitic dermal manifestations, as the consequence of an erroneous diagnosis is far-reaching."

The dean of a long-established college in a central state that has taught dermatology nearly thirty years, writes: "The juniors and seniors do section work in the out-door department every day of the week and receive one clinical lecture a week throughout the whole course. * * * I believe dermatology to be important to practitioners simply because it is necessary to know it. For pedagogic purposes it is one of the most valuable departments as it teaches the student to observe. Hebra was in the habit of saying that in dermatology the diagnosis should be made in the same manner as a mineralogist recognizes a crystal, or a botanist a plant."

A letter from a Pacific coast college, in which dermatology has been taught for over twenty years in conjunction with syphilology and genitourinary diseases, "Regards a knowledge of dermatology and syphilology of great importance not only because of the various manifestations of the latter disease, but also because of the minute distinctions which are necessary to be made in diagnosis * * * to realize the importance of syphilis in its social relations, and to teach students that it is not always or necessarily a disease of vice, to protect the innocent offspring as far as possible from its ravages, as well as those who are already susceptible to its infection." * * *

Without attempt at order, I quote extracts from replies as they were received from examining boards.

The secretary of one of the newer states writes: "I have not at hand a list of the examination questions in the past, but feel safe in saying that there have been but few questions asked by the board of this state at the examinations, upon the subjects of dermatology and syphilology. * * * Your inquiry suggests the importance of giving these subjects more attention at the examinations, and I will send your letter to the other members of the board."

The secretary of a far Western State writes: "Our board in its examination has paid no particular attention to the subjects of dermatology and syphilology. I cannot at this time remember any questions that have been asked on these subjects."

Here follows a schedule of examinations of twenty-two subjects, and one hundred questions. Several similar schedules have been sent me in which disease of skin and syphilis are not mentioned. One may be seen in the *Journal of the American Medical Association,* Volume XLVIII, page 1629, 1907.

The secretary of one of the Northwestern State colleges writes: "I enclose a copy of the schedule of examinations. As you can see we do not give the very important branches of the study of medicine which you mention, any place."

The same secretary writes: "Doctor ——, president of the —— State Board, is the author of a suggestive 'one hundred questions schedule' * * * I think that these branches ought to have a place on every 'schedule.'"

The secretary of the board in one of the older Southwestern States writes: "We have no examination on the subject of dermatology and syphilology. Under the law we are limited to one examination from each congressional district, there being seven in number; therefore we are unable to cover the entire field as well as might be done otherwise. The only questions we have upon this subject is an occasional one from one examiner on practice. The subjects mentioned are important, and

I wish that circumstances were so that we could be able to devote more time to them."

The secretary of the board of a Southwestern State writes: "This board does not examine on these special subjects. * * * In my opinion they are not sufficiently taught, and from my experience as an examiner I believe that a large percentage of our medical colleges should elevate their standard of education, and I think a great deal of the fault is in not having the students proficient as to the requirements for admission."

The secretary of the board of one of the oldest states sends a copy of ninety-eight questions under twenty-one heads. The list includes one question on syphilis and one on bacteriology and one on parasitic diseases of the skin.

The following from the secretary of the board of an old Eastern State expresses report of several other States: "Our law prescribes the subjects in which applicant for license shall be examined, and the only opportunity that there is of questioning an applicant on any of the collateral branches is by the examiner broadening the scope of his examination. I think it important for dermatology and syphilology to be included in the examination."

Another secretary of one of the older Eastern States similarly to last, writes: "Under the law these subjects cannot be treated separately, but questions on these topics may be asked on one of the subheads. * * * Under the law which has recently been passed by our legislature questions on both the subjects will doubtless be additionally asked under other subheads."

In one of the old Southern States the secretary writes: "Our board requires an examination in skin and genitourinary diseases, asking five out of one hundred questions in this branch. Two of the questions are usually devoted to genitourinary diseases and three to skin diseases. We find that about two per cent of our applicants fail on this branch, while it assists in causing failure in the general average of about six per cent."

The secretary of the board of an old Southern State writes, sending questions for past three examinations. * * * "I note that the subjects you mention are not asked there, and the reason of this is that we are not allowed to examine in practice. * * * Ours is a peculiar law, but it is the best that we could get from our legislature."

From the secretary of the board of a large Northwestern State: "As you will notice by enclosed schedule, a special list of questions is not prescribed for dermatology or syphilology. * * * Personally I am of the opinion that the time has arrived when examining boards should pay more attention to these special subjects."

The secretary of the board in another state in the northwest writes deprecating the fact that with ten papers not much can be done on special subjects, yet of a half dozen of lists of past examinations in medicine one or two of the ten questions in each list were well chosen questions in disease of the skin. Most of them acute, some of them communicable diseases. There were also some discriminative questions on syphilis.

The secretary of the board in one of the oldest Western States says: "This board does not give examinations in dermatology and syphilology. * * * There is no time allotted or questions required for either of these subjects."

In one of the largest and most populous of western states a list of twenty-one subjects is furnished by the secretary on official blank, in which is no mention of diseases of skin or syphilis.

From an old eastern middle state the secretary writes: "Diseases of the skin and syphilis are classed by our board with practice of medicine and surgery. There are always two and sometimes three questions in each of these subjects asked. * * * The practice of medicine and surgery are two subjects that most of our applicants fail in. * * * I believe that there is need of more thorough teaching of these subjects by some of the medical colleges, if not by all of them."

The secretary of an old New England state writes: "Since the organization of our board, I do not recall that there have been any questions asked on diseases of the skin or syphilis at our examinations. It is a mistake. There surely should be."

The secretary in an old Southern State writes: "Questions on branches mentioned have very seldom formed part of examinations, probably from the fact that we only examine in writing."

The secretary of the board in a Northwestern State writes: "On dermatology and syphilology we do not make a seperate examination. * * * We have been trying hard for years to get our standard up where it should be, and hope to make many changes in our law at the next session of the legislature."

The secretary of the board in one of the newer Mountain States writes: "Our board of examiners does not conduct any examination on dermatology or syphilology. * * * One or two questions are sometimes asked on these subjects under head of pathology and symptomatology. * * * In my opinion there is a woeful lack of proficiency in the profession at large upon these branches. * * * Trusting that time will bring us out of the present chaotic condition of medical licensure, I am, et cetera."

This writer presents some interesting opinions on the subject of specialism in general, that I regret lack of space prevents copying.

The secretary of the board of a Northwestern State says: "The subjects mentioned have been largely ignored by our board. * * * A question on syphilology occasionally appearing among the questions on surgery. * * * I think it desirable to elevate the subjects mentioned to the dignity of a separate paper."

From the secretary of the board of a Southern State: "Our board does not examine in dermatology except incidentally, * * * nor more than an occasional question on syphilis."

Boards in our neigboring Canadian provinces, so far as heard from, have no special questions, only as part of medicine and surgery.

The secretary of the board of a prominent middle Northwestern State writes: "Diseases of the skin and syphilis are not special subjects with our board and are included or supposed to be included in the questions on practice of medicine. I agree with you that there is need for higher requirements in board examinations in dermatology and syphilology. At our next meeting in October, I shall call the attention of the members to these subjects. * * * I am sending you the questions since 1900; very few questions on dermatology have been asked."

From one of the West Indian Islands: "Candidates for examination as a rule are not acquainted with local skin diseases which are to a great extent parasitic."

A letter from the Surgeon-General of the United States army, which I have permission to publish, states: "The Army Medical School is intended for graduates from reputable medical schools who pass the required entrance examination for appointment in the medical corps of the army. * * * It is probable that of the ten questions asked in practice, not more than one relates to dermatology and syphilis. The course of instruction at the school does not include either dermatology or venereal diseases, except as possible sources of infection under military hygiene."*

The Surgeon-General of the navy writes, quoting Naval Medical Examining Board: "It has not been the custom of the Naval Medical Examining Board to give written questions to the candidates before it in either syphilis or dermatology. * * * Examinations in syphilis are conducted orally as a part of surgery and in dermatology under the title of medicine. There are, therefore, no questions on file. * * * The unimportant place in the examination as a whole, and even under the larger subjects of which they are a part are given minor standing. Candidates as a rule are inclined to look upon an examination in dermatology as in eye and ear, et cetera, as an unfair requirement. It has been the experience of this board that, generally speaking, candidates have but a vague idea of either subject and that a higher requirement would be futile, unless the questions be taken up primarily by the medical schools and more given and more required there."

A copy of extracts from regulations and instructions in relation to the physical examination of recruits for enlistment in the navy and marine corps, kindly sent with letter, makes it apparent that such examinations could not be intrusted to men who "looked upon an examination in dermatology as in eye and ear, et cetera, as an unfair requirement," or who had' but' a "vague idea of either subject. Syphilis is one of the general disqualifications for recruits.

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*The last Annual Report of the Surgeon-General of the Army gives venereal diseases as most important factor affecting efficiency of army. There were constantly on sick report for this class of diseases seven hundred thirty-nine men.

The Surgeon-General of the Public Health and Marine Hospital Service writes in reply to inquiry: "To the extent to which the examinations for entrance into that service requires a knowledge of skin diseases. * * * The questions on this subject asked on examination, come under the heads of practice and pathology and bacteriology. * * * Invariably at least one question deals with this subject, and very often two or three questions during the course of the examination have a direct bearing upon diseases of the skin. * * * The number of questions asked on any one subject is usually four or five, and from this the relative importance given to skin diseases can be judged. * * * Among candidates for entrance into the service a fair knowledge of skin diseases is usually found.

A copy of "The Book of Instruction for the Medical Inspection of Imigrants," kindly forwarded, shows the need of special knowledge to determine the "contagious" and "loathsome" diseases, which under the immigration law, are excluded from admission into the United States.

The enlarged area of our own country; international travel and the great and constantly increasing immigration to our shores, offer increased opportunity for the introduction of communicable disease most frequently manifested in the skin, and make it very necessary that immigration and quarantine examiners be skilled in diagnosis of dermal affections. For similar reasons the general practitioner who renders first aid in so many cases, should have every facility that teaching can supply to acquire a reasonably good working knowledge in the diagnosis and treatment of at least the ordinary diseases of the skin and syphilis, and the opportunity to demonstrate it before examining boards.

The schools teach what their faculties suppose scientific medicine demands and what the student should learn, much of which is necessarily elementary. The college may confer degrees, but the law, with wise intent has restricted the authority to license to practice, to examining boards. These licensing boards supplement the college. They determine in what the candidate should be examined, and what per cent of questions he should answer correctly, to pass or fail, and practically control the situation. If applicants for license are lacking in qualifications that the examiners believe necessary for the safety of patients, and this fact appears in reports, the colleges interested will surely try to prevent the recurrence of failure with their graduates.

It is not necessary to make comparisons, or to disparage other departments of preparatory work, but it would seem obvious that an examination to determine the fitness of a candidate to *practice medicine* should make sure of his ability to make *practical application* of fundamental teaching in laboratory, didactic, and clinical work, in diagnosis and treatment, and particularly in emergent conditions where it is important that a correct diagnosis be made.

It seems a rational proposition that higher requirements in examinations by colleges and by licensing boards, will go far to secure this desideratum.

NOTE.—Several letters have been received since this paper was written, among them one from Doctor ———, professor of dermatology and syphilis at the University of Havana, who states: "We recognize, on account of its frequency, the study of the diseases of the skin of great importance. The entire course in the University of Havana is a three month's course yearly,—consisting of daily lectures of an hour, besides the clinical instruction which takes longer time. All the year round we have the opportunity of showing our students patients of these diseases, and demonstrate to them the great importance for the general practice."

Accompanying the letter the professor kindly sent a copy of the index of the text-book which he has published in Spanish, giving eighty-seven lectures, very thoroughly covering the subject.

Ann Arbor, 402 Huron Street East.

ORIGINAL ABSTRACTS.

SURGERY.

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THE PREVENTION OF HEMORRHAGE IN RESECTION OF THE LIVER.

IN *Surgery, Gynecology and Obstetrics* for September, 1907, Doctor Garrè considers preventing and stopping hemorrhage in resection of the liver. The doctor states that he wishes to prove, by several cases which he cites at the end of his paper, that the dreaded bleeding from all operations on the liver can be controlled by isolated ligation of vessels with silk, and deep constricting suture of the wound with catgut.

He then reviews the various methods that have been used for hemostasis in operations on the liver. The cautery of Paquelin has been employed quite extensively, but in major operations on this organ, if such a term may be used, it has answered the purpose very imperfectly indeed. Another objection to its use is that the eschars resulting make it practically impossible for the vessels to be grasped by forceps and tied. The other thermic methods of hemostasis are only in their infancy and are not to be at all relied on.

As to preventive hemostasis in the liver one cannot expect much, because as soon as the operation has penetrated the interior of the organ it is impossible to so compress the liver substance as to prevent bleeding. Various clamps, such as Doyen's elastic stomach clamp and Masnata's clamp, however, should be utilized as much as possible.

Temporary ligation of the portal vein, as recommended by Langenbuch, should not be accepted except under gravest necessity.

Packing of the liver wound has been recommended by some but in the cases in which this is done we have the grave objection that the laparotomy wound must be left unclosed. The doctor believes that in all resections of the liver the laparotomy wound should be closed immediately.

Ransohoff, on the contrary, believes that immediate closure of the laparotomy wound should be rejected unconditionally because of secondary intraperitoneal hemorrhage, fatal in two cases reported by Wagner and Langenbuch. Baldassari, disagreeing with the view of Ransohoff, has tried another method. "He cut from the edge of the laparotomy wound a flap consisting of peritoneum and transversus muscle and sutured it widely to the bleeding wound of the liver. As usual, the catgut threads cut into the liver parenchyma on being tied, but the transplanted muscular flap offered sufficient resistance for the arrest of the hemorrhage." This method worked quite well, the flap being absorbed, but there is a grave objection to it in that the danger occasioned by implanting extensive parts of organic tissue, which becomes necrotic on account of bacteria, which the liver is not always free of. The elastic ligature he believes to be unsafe notwithstanding Filippini's reports to the contrary.

Casati, with a movable liver stump, has stopped hemorrhage successfully in his two cases by using the two edges of the laparotomy wound to support the constricting sutures. In the most severe operations, however, the movable liver stump is wanting.

Page and Martina, in 1905, published a procedure of preventive hemostasis and union of the wounds of the liver. These authors were evidently haunted by the same fear that followed many other surgeons, namely, the fear of the threads cutting through the liver substance and not holding. Plates of pure magnesia metal were pressed firmly against the upper and lower surfaces of the liver laterally from the lines of resection; catgut sutures were then passed through the liver substance and supported by these plates. The objection to this method is that the magnesia is decomposed under considerable development of gas with the very probable formation of gas cysts.

Many operators complain of the impossibility of applying hemostatic forceps, which may be explained by the fact that after the vessels are cut after being on a stretch they very naturally retract, and it is next to impossible to catch them. Another difficulty is found in the fact that the veins on the surface of the liver are frequently opened in an oblique direction. A small circular suture should be used in this case. He believes in the use of fine silk threads instead of catgut for suture material. Number 0000 silk is used by him without any secondary suppuration. For the deep suture he uses catgut Number 2 on account of his dislike to burying silk threads. For uniting the serosa of the liver he would willingly use Number 2 silk.

The mortality of liver resections is calculated at fifteen or twenty per cent, but with improved methods which are rapidly coming into use this percentage will very materially decrease. The doctor has so far not lost a single case in his resections of the liver, and has seen neither secondary hemorrhages nor lung complications (embolus).

Several cases are cited by the doctor at the end of his paper. These cases include resections for (a) carcinoma of the gall-bladder which invaded the liver without making metastases; (b) for echinococcus cyst located close to the gall-bladder; (c) for sarcoma of the liver located on the edge; (d) for three other cases of echinococcus cyst. Recovery occurred in all cases; in nearly all, also, it was uncomplicated.

The doctor believes his success in these cases can be attributed largely to his immediate closure of the laparotomy wound. F. B. W.

HYPEREMIA TREATMENT IN TUBERCULOSIS OF THE PERITONEUM.

In the December (1907) number of *Surgery, Gynecology and Obstetrics* Doctor A. E. Hertzler, of Kansas City, describes some experiments performed by him several years ago. At that time he regarded these experiments and their results as only of physiologic interest. His attention, however, has lately been drawn to them by the controversy regarding what took place when the abdomen was opened in cases of tuberculous peritonitis. He attributes the good results to the great dilatation of the abdominal blood-vessels and the consequent intense hyperemia of the abdominal cavity.

The pressure in the abdominal cavity is controlled by the diaphragm and the so-called abdominal muscles. Now if an opening is made in these muscles, by the use of various devices, such, for instance, as a piece of window glass sewed in the belly of a guinea pig, it was seen that the blood-vessels dilated widely and that if air was forced into the cavity and the intraabdominal pressure consequently raised, they began to contract. The results thus of opening the abdominal cavity are hyperemia of the peritoneum and subperitoneal tissues. Anemia of the peritoneum may be brought about by the collection of fluid in the abdominal cavity caused by any disease, which condition is remedied by the opening of the cavity and the following decrease in the intraabdominal pressure.

Hyperemia has been found of use in the treatment of tuberculosis elsewhere and, with this fact in view, we are warranted to make the assumption that it would be of the same use in tuberculosis of the peritoneum. Clinically it is found, also, that it is only the tubercular form of exudation that is helped by this treatment.

The question naturally arises if one treatment does good would not several treatments do greater good? He believes that they would, and thinks that it would be practical to try just such a course of treatment on a patient. F. B. W.

GYNECOLOGY.

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TREATMENT OF CYSTOCELE AND PROLAPSE.

Duhrssen (*Surgery, Gynecology, and Obstetrics,* Volume IV, Number V) takes occasion to refute Watkins' claim to originality for an operation designed by the writer for the relief of cystocele and uterine prolapse. It has been the experience of all gynecologic surgeons that prolapse of the uterus, especially when accompanied by a cystocele, is very hard to relieve by operative measures. Removal of the uterus by the vaginal route, as practiced by many, lessens the inconvenience to the patient for only a short time, the vaginal walls, being relaxed, soon descend and evert, the anterior wall forming in many cases a distinct pouch or cystocele. To overcome the uncertainties of the after results of the usual operations for prolapse, Dührssen has originated a method for which much good is claimed by various European gynecologists.

The operation, according to Dührssen's directions, consists of (1) loosely dissecting the bladder from its attachments at the base, producing a spontaneous reduction of the bladder hernia, (2) inserting between the vaginal wall and the bladder a cushion, making use of the uterus for this purpose.

The technic outlined is, first amputate the cervix if it is elongated, then make an inverted T incision through the mucosa of the vaginal wall over the anterior portion of the cervix, dissecting away the bladder from its vaginal and cervical attachments until the peritoneum is reached. The uterus now becomes visible and is pulled forward with forceps and sutured to the vaginal walls, the bladder having been pushed up above. The vaginal flaps are then trimmed and united in front of the uterus, a small drain being left in the line of incision. A perineorrhaphy then completes the operation. Dührssen claims that no ill effects will be experienced in labor after his operation if only a single suture unites the uterus to the anterior vaginal wall. C. G. P.

Jackson, Michigan, The Colony.

PEDIATRICS.

ARTHUR DAVID HOLMES, M. D., C. M.

THE WEIGHT OF BREAST-FED INFANTS.

Griffiths and Gittings publish (*Archives of Pediatrics,* May, 1907) the results of careful observations of the following: (1) Birth rate and the causes influencing it. (2) Loss and gain in weight in the first two weeks of life and the influences which affect them. (3) Is the initial loss physiologic?

The writers found that the average weight of 111 normal male infants was seven pounds 11.35 ounces and of one hundred fifteen girls was seven pounds 8.57 ounces. Combining these figures with those of other investigators, the average birth weight of boys may be considered to be seven pounds ten ounces, and of girls seven pounds six ounces.

The initial weight may vary considerably within normal limits. and infants weighing from six to nine pounds may be regarded as normal. The largest and heaviest children are born between the twenty-fifth and twenty-ninth years. The children of multiparæ weigh more than those of primiparæ. Health and robustness of the mother influenced the initial weight of the infant. In the majority of instances the initial loss of weight continues for from two to four days. The time of regaining of the birth weight is from ten to fourteen days. From a comparison of all statistics the average total loss is from seven to eight ounces or from one-fifteenth to one-seventeenth of the body weight. Boys experience a smaller loss than girls as well as a slightly earlier regain of the original weight. The heavier the full term baby, the greater will be the initial loss. The children of primiparæ lose more and are longer in regaining the lost weight than those of multiparæ. The initial loss of weight in a newborn infant cannot be entirely prevented. It can be materially lessened by the exhibition of the milk of another nursing woman until the mother's secretion has been established. Yet this offers no very great advantage. The administration of any artificial food during the first days of life is not justified.

ORTHOPEDICS.

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BILATERAL TUBERCULOUS BURSITIS OF THE HIPS.

E. Owen Thurston, C. B., B. S. (London), F. R. C. S., of Calcutta, India, contributes an article on this subject to *Annals of Surgery*, Volume XLVI, Number VI. The patient was a Hindu male child, aged eight years, who one year previous to admission to the hospital had suffered from fever for a month. During this time he began to have pain in the left hip and a little later a similar pain in the right hip. The pain diminished as swelling advanced and the inconvenience in thigh movements prominent at first also passed away. On admission the boy was emaciated and anemic, hips symmetrically swollen, extending from the iliac crest above to the gluteal fold below, and on the inner side to the sacroiliac articulation. Anteriorily the swelling extended from the outer half of Poupart's ligament external to the great vessels outward to the insertion of the gluteus maximus. Fluctuation was easily obtained.

The abscess on the right side was operated first with the evacuation of a large quantity of pus, caseous material and calcereous particles. Counter incision was made, the cavity scraped, irrigated, and both openings closed, drainage being left in the first incision. Seventeen days later similar procedures were instituted on the left side. The wounds healed by first intention and the progress was uneventful except that a residual abscess on the right side appeared about one month after leaving the hospital.

LARYNGOLOGY.

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THE NOSE AND THE THROAT AS A FACTOR IN THE ETIOLOGY OF ERYSIPELAS.

Erysipelas is now recognized as an acute, infectious disease due to streptococcic infection, and characterized by inflammation of the skin, mucous membranes, and in the more severe cases by the involvement of the subcutaneous tissue.

For many years the relation between injuries and surgical wounds, and erysipelas has been well known; and according to the supposed etiologic cause, or the part involved, there has grown up a classification which has been handed down to us from the older authors. In this classification it was customary to speak of one large group of cases as idiopathic. These so-called idiopathic cases usually involve the face, run a fairly mild course, and because of their unknown origin are grouped in the idiopathic class. The belief has gradually grown that these idiopathic cases, like the others, are due to infection, and it only remained to demonstrate the point of entrance of the virus.

It is now generally accepted that the nose and the throat,—more especially the nose,—is the site through which the virus gains entrance into the tissues. A slight abrasion in the nose is sufficient to allow infection in a susceptible individual, and from there the inflammation spreads by continuity to the adjacent tissues. Scattered through the literature of the subject there are now numerous cases cited in which the nose was the point of infection.

The most exhaustive paper on the subject of which we are familiar is the one entitled, "Etiology of Erysipelas," by C. R. Holmes (*Annals of Otology, Rhinology and Laryngology,* September, 1907). After a study of the subject from various standpoints his conclusions can be summarized as follows:

(1) The identity of the streptococcus as the microbial cause of erysipelas.

(2) The practically constant presence of the streptococcus and the pneumococcus in the normal nose and neighboring spaces.

(3) The great variability in pathogenicity of the germs.

(4) The extreme frequency of erysipelas of the face, as compared with other parts of the body.

(5) The better understanding of the nature of the disease, and the intelligent use of antiseptic and aseptic methods has materially lessened the number of the infections; but the difficulty of freeing the nose and the neighboring parts of the germs, and the ease with which abrasions of the mucous membranes occur make it impossible to eliminate all sources of infection.

The reviewer recalls several severe cases in which an abrasion in the nose was the point of infection. In one instance a physician was able to trace the infection in himself from a case of septicemia which he was treating. The virus was carried by his finger to the nose.

In an article entitled "Acute and Chronic Suppuration of the Ear and Nose the Direct Cause of Erysipelas" (*Journal of the American Medical Association,* Volume XLVII, page 2053) Cullen F. Welty discusses this subject. He states that in eighty-two per cent the facial erysipelas starts from the angle of the nose, and quotes Spohn that out of a thousand cases, nine hundred were confined to the face.

Doctor Welty, in two years, observed sixty cases, all confined to the face. The point of inoculation in the large majority was about the nose.

"A Statistical Study of Erysipelas," by L. N. Boston (*Journal of the American Medical Association,* Volume XLIX, page 1520), shows among other things that by far the larger proportion of all cases occur on the face, that males are more subject to the disease than females, and that the greater number of cases occur during the winter months. This last observation is what we should expect if the site of infection is the nose. W. S. A.

RADIOLOGY.

VERNON JUSTIN WILLEY, M. A.
INSTRUCTOR IN ELECTROTHERAPEUTICS IN THE UNIVERSITY OF MICHIGAN AND DIRECTOR OF THE UNIVERSITY HOSPITAL ROENTGEN LABORATORY.

PLASTIC ROENTGENOGRAPHY, OR THE REPRODUCTION OF *X*-RAY PICTURES IN RELIEF.

DAVID MORGAN (*Archives of the Roentgen Ray,* December, 1907) and Doctor Béla Alexander (*Archives of the Roentgen Ray,* January, 1908) discuss the possibility of producing radiographs in relief, that is, with perspective, which perspective is not present in the ordinary radiograph—at least not unless specially made and viewed by means of a suitable stereoscope.

The advantages of radiographs which really give perspective—such as some of the illustrations presented by Doctor Alexander seem to possess—lie principally in the ability of the radiograph to show the finest details of structure in a clear and unmistakable manner. Details which may be completely hidden by the superposition of shadows in the ordinary roentgenogram stand out with astonishing clearness in the plastic roentgenogram. The contrasted shadows are in some cases intensified, and thus the details of the plate are made sharper and clearer. Relationships and forms are brought out in a manner impossible by the ordianry radiograph. The technique, which must be carried out with precision and exactness, and requires some experience to insure success, is in brief as follows. Against the film side of the original negative—which should be clear, sharp, with plenty of detail and not too dense—a slow plate is placed, film to film. The edges should be bound with binding tape or adhesive so that no light passes between them—or they may be held in exact position by a good printing frame. These are exposed in the usual way to artificial (gas or electric) light. The second plate is then removed, developed, fixed, washed and dried. When dry, these two plates are placed together, glass to glass, films facing out. The images must be perfectly superposed and held in this position. If now light is allowed to pass through them obliquely the plastic effect is well seen, varying in degree with the angle at which they are held to the source of light. This angle, once determined, is the angle used for making a third plate. This plate may be used as the plastic diagnostic plate, or prints may be made from it if desired.

The process is more tedious and more difficult than that employed in making stereoscopic roentgenograms, but it possesses sufficient advantages over that process in some instances to warrant the extra effort necessary to obtain the plastic diagnostic plate.

DIAGNOSTICS.

FRANK SMITHIES, M. D.
INSTRUCTOR IN INTERNAL MEDICINE AND DEMONSTRATOR OF CLINICAL MEDICINE AT THE UNIVERSITY OF MICHIGAN.

THE BACTERIOLOGY OF THE BLOOD IN TYPHOID FEVER.

Coleman and Buxton (*American Journal of the Medical Sciences,* Volume CXXXIII, Number VI) report on the blood findings in sixteen hundred two cases. In seventy-five per cent of the cases examined at all stages of the disease, the typhoid bacillus was found. They report the most successful results where the blood cultures are made on media containing ox bile, as suggested by Conradi. "The method followed has been to take ox bile ninety cubic centimeters, glycerin ten cubic centimeters, and peptone two grams. The mixture is distributed into small flasks, twenty cubic centimeters in each, and sterilized. Three of these flasks are used for each examination, about three cubic centimeters of blood being run into each. The flasks are then incubated, and the next morning streaks are made from each flask over the surface of a litmus-lactose-agar plate. If microorganisms are present, a growth may be observed in five or six hours. If the growth does not redden the medium and is found to be a bacillus resembling the typhoid organism, it is tested for the Widal reaction with immune serum."

The bacillus appears to be found more consistently in the blood during the early weeks of the disease. (First week, eighty-nine per cent; second week, seventy-three per cent; third week, sixty per cent; fourth week, thirty-eight per cent; after the fourth week, when looked for, twenty-six per cent.) The writers agree with previous workers that the bacillus promptly disappears from the blood at the beginning of the afebrile stage of the disease. They are inclined to conclude that typhoid fever does not constitute a true septicemia, but is rather the result of an overflow of bacilli from the lymphopoietic organs. These organs, be they situated where they may, are first infected with the bacillus, there is an outflow into the blood stream, bacteriolysis ensues, with the liberation of endotoxin, and clinically, the disease follows. In support of the fact that the endotoxins do not appear cumulative, they cite the observation that convalescence is established a few days after the disappearance of the typhoid bacilli from the blood stream.

MULTIPLE RHEUMATIC NODULES IN AN ADULT.

Garrod ("Proceedings of the Royal Society of Medicine," London, Volume I, Number I, November, 1907) reports a case, a woman aged twenty-five, showing nodules closely resembling the rheumatic nodules of children, over the metacarpo-phalangeal joints of both hands, upon both elbows, over each patella, and on the right shoulder. The patient had had "rheumatic affection" for about two years, and the nodules had been present for about fifteen months without change. The heart was not affected. Doctor Garrod considers that this fact might differentiate these cases from similar affections in children, where the subcutaneous nodules are frequently found, but where the rheumatic changes in the heart are generally coincident. He is inclined to the opinion that where such nodules are found in adults the pathologic condition is not alone rheumatoid.

WASSERMAN'S SERUM REACTION IN SYPHILIS.

Michaelis (*Berliner Klinische Wochenschrift,* September 2, 1907) reports his observations in fifty-two cases. In but four instances where a diagnosis of syphilis was positive or suspected was the reaction negative. One of these cases had a lesion of more than thirty years' standing, another had a doubtful diagnosis of cerebral lues, the third was a case of primary lesion, two weeks old, which had been under treatment with mercury, and the fourth was a case of progressive paralysis with primary lesion twenty years previously. Of twenty-six cases where the diagnosis of syphilis had not been made, there were two positive reactions, one suspicious reaction, and twenty-three negative reactions. The two positive cases were in a patient with a history of five abortions and an old man with apoplexy respectively. The suspicious reaction occurred in a case of phthisis. Cases under treatment or in which such had been energetically carried out did not give so pronounced reactions as those which had not been thus followed up.

THERAPEUTICS.

DELOS LEONARD PARKER, PH. B., M. D.
ADJUNCT PROFESSOR OF MATERIA MEDICA IN THE DETROIT COLLEGE OF MEDICINE.

RADIUM FOR THE TREATMENT OF CANCER AND LUPUS.

William J. Morton, M. D., of New York (*Medical Record*, November 9, 1907), describes his experiences with radium in treating cancer and lupus. He begins his article by saying that in the absence of a positive cure for cancer every real aid in the treatment of this disease is worthy of study, and this not only for the good it may accomplish directly but also for the good it may lead to in the future. He disclaims also any intention of putting forward radium, or anything else, as a "cancer cure." He wishes it to be understood that a searcher for truth has the right to report cures of some cases of cancer without wishing to be understood that cures in all cases will follow the treatment that may have been successful in a few cases.

The Roentgen ray, it is stated, now cures many cases of superficial cancer. Radium in the same cases would have a like result with numerous advantages in other directions. Thus it is claimed that radium can be applied with greater accuracy of dosage, with greater penetrating power, with exclusive use of the beta or cathode ray, and with prompter results. Doctor Morton, for the greatest penetration, employs Lieber's aluminum tubes, containing respectively ten milligrams each of pure radium bromide, as made by Doctor Sthamer, of Germany, and having an estimate radioactivity of 1,800,000. He also uses tubes of lower and of different radioactivity as made by Hugo Lieber, of New York.

The method of applying the tubes varies to some extent with the case. There are two principal methods—one consisting of frequent consecutive settings of short duration extending over several weeks or months; the other of from one to four or six sittings, each lasting from twenty minutes to an hour or more. By the second method the operator expects to produce a severe radium burn, but the normal tissue heals while the cancerous tissue (rodent ulcer type and superficial face cancer) disappears. Sound tissue is less affected by radium than is cancerous tissue. Radium invokes no increased growth as would an irritant. Whatever gain is accomplished remains secured.

As a rule the radium, contained in an aluminum tube, which is covered with a fresh celluloid tube each time it is used, is buried in the cancerous mass. Sometimes a silver shield is placed on one side to protect sound tissues from the ray. In this way the whole force of the ray is applied to the tumor instead of losing much to the skin as is the case when the tube is placed on the surface. While the local treatment is continued radioactive water is administered internally. Also invariably an aqueous solution of fluorescin, or of esculin, or of quinine is administered in order to excite this fluid to fluoresce within the cancerous tissue during the radium treatment. In all cases care must be taken to have the radium salt pure.

Doctor Morton reports several cases in detail in some of which cancerous growths have disappeared and have shown no sign of returning after a lapse of two years.

EDITORIAL COMMENT.

ESTOPPEL PROCEEDINGS ANENT MEDICAL PERIODICALS.

Horace Greeley is credited with relating an incident about a man who ordered his great metropolitan paper discontinued but still the daily chronicle persisted. The disgruntled one entered the sanctum in a flurry and surprised the editor by saying that he had stopped the paper. The scribe expressed doubt regarding this information and strengthened his position by escorting the stranger to the pressroom, where every revolution of the cylinder gave evidence that the paper still survived. This subscriber probably did not realize that the almighty dollar is a vital consideration in the process of publication estoppel. Proceedings must be instituted according to Hoyle, so to speak, since there are rules or laws governing about everything. The individual represented a class of the laity who do not understand how to proceed even in ordinary business transactions. Some of the professional caste are likewise uninformed regarding methods of procedure in business affairs, particularly the medical. The average physician is not supposed to be versed in the principles of business. His forte is contemplated in the principles and practice of medicine. The deficiency is recognized by mankind generally, and is demonstrated sufficiently in mining deals to exclude even a vestige of doubt.

The phase of the question selected for consideration at this writing is that bearing on the relation of subscribers to periodicals. This is indeed a question that occasions a vast deal of unpleasantness owing to lack of pertinent knowledge on the part of some physicians. It is a question that is regulated by law, and a legal axiom declares that ignorance of the law excuses no one. Awhile ago a Detroit doctor arose in medical meeting and solicited information respecting the modus operandi for insuring discontinuance of a certain medical journal. It seems that the gentleman had exhausted much energy going around by Robin Hood's barn instead of pursuing the straight course. For a moment silence reigned supreme! Presently, however, a man over in the corner, who understood the situation, jumped to his feet and jocosely exclaimed—"Liquidate your indebtedness!" These three words solve the problem exactly, and there is not a reputable journalist in the land who will not discontinue *on* order providing arrearages are liquidated to date *of* order.

The better type of medical journals depend upon the better element of the profession for support, otherwise publication would be impossible. The unanimous dictum of publishers is to the effect that friction is unknown in dealings with the representative class, misunderstandings which may occur being agreeably adjusted by reason of the gumption displayed on both sides. Occasionally, however, there are instances of friction in a small contingent wherein even resort to the subterfuge of having "never ordered journal" is advanced to justify repudiation of indebtedness,— as though payment would be exacted were subscription not contracted. Out of the depths often emanates a wail from the individual who "ordered the journal stopped" regardless of the fact that when the request was submitted an arrearage demanded attention. The person who is really abused, however, is the one who insists that "the journal is being forced upon" him. What a distinguished person such a one must consider himself to imagine that a publisher would spend time endeavoring to compel affiliation with the fold when there are physicians galore who can both read and comprehend. The neural clinician would pronounce this character a paranoiac!

The inference to be drawn from these observations points to something radically wrong with the method employed by certain doctors to secure the discontinuance of medical journals. By way of imparting information on this matter, the proper procedure may be said to contemplate negotiating direct with the office. Ask for a statement of account to date and remit the amount immediately, with the request to discontinue, for procrastination simply places one in arrears again, and herein the trouble arises. The second statement is met with the response that settlement has already been made, evidencing that no cognizance is taken of indebtedness that accrues in the interim between *request* and *remittance.* An order should never be given to an agent, his business being solely soliciting and collecting. Since an agent receives no commission on discontinuances no service is rendered in this direction. Medical journalists generally do not employ representatives to go about the country soliciting orders of this nature, and speaking for this journal particularly the number of discontinuances recorded yearly has never seemed to warrant assigning a man to that occupation.

The majority of medical journalists are honest and will honor a request made in good faith. The average journalist dispenses pabulum the value of which is far in excess of the subscription annuity, even were the contingent which balances indebtedness with a "refused" notice to take cognizance of just delinquencies. A scathing estimate is paid to the "refusal" species by the memorable humorist, Bill Nye, and his opinion is appended as a fitting finale to the foregoing lesson, trusting that he to whom reference is made will begin the new year right. "A man may use a wart on the back of his neck for a collar button; ride on the back coach of a train to save interest on his money until the conductor comes around; stop his watch at night to save the wear and tear; leave his 'i' and 't' without dot or cross to save ink; pasture his mother's grave to save corn;—but a man of this kind is a gentleman and a scholar compared to a fellow who will take a newspaper, and, when asked to pay for it, puts it into the postoffice and has it marked, 'Refused!'"

ANNOTATIONS.

ABNORMAL GROWTH OF MAMMARY GLANDS.

HYPERTROPHIED mammary glands, due to repeated attacks of erysipelas of these organs, is reported by Bogoljiubow in a country girl, aged eighteen years. In all seven attacks were experienced and the organs gradually increased in size until they extended seventeen centimeters below the umbilicus. In circumference the right gland measured forty-five centimeters and the left forty-four. Amputation was finally performed and microscopic examination made, a part of each gland being saved for cosmetic effect. No alterative changes were noted, except excessive hypertrophy of the connective tissue. The right gland weighed nine and one-half pounds and the left ten. Six and one-half years after operation the patient experienced childbirth. The portion of the glands remaining again hypertrophied but soon returned to normal. While only two cases of similar nature are recorded in medical literature, the author is of the opinion that many of the cases of elephantiasis of the mammaries are due to erysipelas.

PRENATAL CONTRACTION OF PNEUMONIA.

THE relatively rare condition of fetal pneumonia is but imperfectly known to medical men, and while but few cases are on record, Menetrier and Touraine, who recently observed a case, are of the opinion that it is of more frequent occurrence than might be supposed. These investigators had occasion to observe a pregnant woman, forty-five years of age, who had contracted pneumonia seven days earlier. She was of robust physique, the mother of six children, and at the time of her sickness was six months pregnant. Of her offspring three were living and three had died of bronchopneumonia. The oncoming of the disease was preceded by a chill, violent pain in the side, dyspnea, and prostration. Ten days after the inauguration of treatment patient's temperature subsided to normal and the consolidation rapidly disappeared, but on the eighth day fetal movements ceased. On the tenth and eleventh days she was seized with labor pains and the fetus was expelled dead. Autopsy on the fetus was performed about thirty hours after birth. The lungs were large and light red in color, and a diffuse congestion of the left lung was observed. The surface of the middle lobe of the left lung was of dark reddish-brown color. Here the induration was the size of a large nut. The pleural effusion was negative, and the other viscera were not impaired, but the spleen and liver were somewhat larger than normal and showed slight congestion. Pneumococci and a few streptococci were determined in cultures of the blood, and sections of the liver presented the pneumococcus. The conclusion of the authors is that the disease was transmitted from mother to child, and that the fetus passed through the same sort of pneumonia as did the mother.

RARE OBSTETRIC CASE REPORTED BY OLLERENSHAW.

An interesting case of triple birth is reported by Ollerenshaw. The mother, sixteen years of age, was admitted to the Kensington Infirmary when eight months advanced. Noteworthy about the case is the fact that the father was but seventeen years of age. On the day following admission to the hospital, patient became cyanosed, convulsive and finally unconscious. At 7 o'clock P. M. on the same day a second convulsion followed, whereupon patient was anesthetized and a male child, weighing two pounds and fourteen ounces, delivered. The second child weighed eight ounces less, and the next child was the largest of the trio, weighing three pounds and two ounces. Peculiar about the third fetus was the fact that it was contained in separate membranes, demonstrating fertilization of a single ovum. The first two fetuses were contained in a common chorion, demonstrating that they were uniovular. The mother remained in a critical condition for twelve hours after labor, without return of convulsions, however, and eventually recovered.

PRACTICAL DATA REGARDING BLOOD PRESSURE.

Stowell has been conducting experiments with regard to the relative blood pressures in adult and child life. In all two hundred sixteen children were examined, the instrument used being the Riva Rocci with broad arm band. Sclerotic vessels are almost unknown in adolescent life and therefore the sphygmomanometer was not employed for their detection. Blood pressure in the young was low in proportion to extreme youth, and the emotions played as great a part in the rise and fall as in the adult. High pressure may be the result of nervous disease, and acute disease with high temperature may give rise to either high or low pressure. While blood pressure readings in children have no clinical significance, physiologically they are of interest. This investigator found that the carotid in man supported a column of mercury from one hundred fifty to two hundred millimeters high, sustaining the average physiologic figures. Blood pressure depends upon many factors—peripheral resistance, energy of the cardiac contraction, elasticity of the arterial walls, and the volume of blood. Pulse rate and pressure do not necessarily increase together, the volume of blood and its quality being conditions which stimulate the heart to strong or weak contractions. Arterial pressure is increased to a certain point by increased abdominal pressure, but beyond that point it diminishes. The heart's action, as well as arterial pressure, is affected in marked degree by mechanical interference of a distended stomach.

CONTEMPORARY.

PHARMACISTS AND PHYSICIANS.

[DOCTOR SOLOMON SOLIS-COHEN BEFORE THE AMERICAN PHARMACEUTICAL ASSOCIATION.]

For the last few years pharmacists and physicians, working side by side, have set themselves to amend some of their errors and mistakes of the past. It lies not in the mouth of the physician to reproach the pharmacist, nor in the mouth of the pharmacist to reproach the physician. We have erred together, and we are determined to redeem ourselves together. The mere trade in patent medicines, the frauds and fakes and deceits of all kinds, need not here concern us. These are crimes, not errors. There are many other crimes outside of the domain of medicine and outside of the domain of pharmacy, and we have not engaged in a general reformatory enterprise. Other organizations and other agencies exist for such purposes, and in their work some of us, as individuals, are taking more or less active part. But the movement to make the drugs, whether the products of manufacturing houses or the products of individual pharmacists, which are dispensed over the counter upon prescription,—the movement to make these drugs in fact what in name they purport to be, is one in which the organized professions of medicine and pharmacy have a common and lively interest, and in which the physician's patients, the druggist's customers, have the greatest interest of all. I recognize and you recognize—we must recognize—that in the general progress of science, the general advance of discovery, the general improvement of the arts, there must be corresponding progress, discovery, improvement, in the processes of manufacture and preparation of pharmaceuticals. Hence there is abundant room, and, indeed, necessity for the enterprise of chemical and pharmacal manufacturers, whether they occupy the general field of phermaceutic production or devote themselves to specialties. For example, how can the individual pharmacist undertake to prepare and supply the great group of animal extracts and serums which play such a large part in the therapeutics of today? And so with various inorganic chemical compounds, alkaloids, and even some galenicals.

The retail pharmacist should be skilled and enterprising, but there are many things in modern pharmacy for which the average pharmacist, with his necessarily limited time, space and equipment, must look to some establishment which possesses the proper facilities and is thoroughly organized to do well on a large scale what can only be done imperfectly on a small scale. We all recognize that, and the American Medical Association has taken steps, individual physicians have taken steps, to place the medical profession in proper relation with the great manufacturing houses, both those of just fame in Europe and those which are in so high degree a credit to progressive American pharmacy and to American business enterprise. We want to have the most friendly relations with them all, so that these firms may be encouraged to prepare and to offer to us, for the benefit of our patients, the best and purest and most definite pharmaceutical products. And yet, after all is said on this side of the question, there is still a place, and there must always be a place, honorable and important, for the individual pharmacist, for the retail druggist,—call him by whatever name you please,—for the individual who studies and practices as a scientific art the profession of pharmacy. * * * And now just a word as to the outlook for the future of pharmacy.

The dependence of the patient upon the physician is reflected in the dependence of the physician upon the pharmacist. It is true that the greatest advances which have been made in medicine are those of preventive medicine, of hygiene and sanitation. We are aiming to teach people how to live sanely and avoid disease. We aim to teach communities to purify their water, and keep their streets clean, and incinerate their garbage, and isolate those sick of contagious disease, and safeguard their food supplies, and do all other things necessary to provide a wholesome environment for the mass and for the individual. It is also true that when disease occurs we now make increased use of those measures which I have ventured to term "Physiologic Therapeutics," that is, methods other than drug giving, air and light, and food and water, and rest and exercise, and immuning sera and antitoxins and radiant forces and mental influence; in a word, those influences which have been potent in the evolution of man and are most potent in restoring him to his normal condition. Yet beyond the present domain of preventive medicine, and beyond the present domain of physical and mental therapeutics, is a great domain of disease in which alleviation and remedy can be best achieved through those means, which you, members of the American Pharmaceutical Association, prepare and furnish to the physician.

It is a poor boast to say that one knows only four, or fourteen, or forty useful medicines. One need not neglect pathology or diagnosis, hygiene or physiologic therapy, in order to learn how to apply every means offered by nature or art to the relief of suffering and the assistance of recovery. You with your science and your skill, with your knowledge of botany and zoölogy, of mineralogy and of chemistry, search the world over with patient industry to find means by which the physician may be enabled to relieve the distress and to promote the recovery of his patient; and when a certain molecule that promises to be useful does not exist in nature, the pharmaceutic chemist goes into the recesses of his mind and searches it out there and synthetizes it by his skill, and produces it by his mastery of matter and energy, and gives it to us for an additional weapon in the fight against disease and suffering; and for that we and our patients are thankful. We depend on you, therefore, to prepare us for that which exists in nature, and to find for us that which art—or rather science applied in art—alone can furnish.

And in conclusion, going back to what I said in the beginning, if you pharmacists and we physicians have made mistakes in trade, or in science or in art, let us get together and amend them. Let us get together not for reproach or recrimination, but for mutual encouragement in well-doing. Thus can we strive shoulder to shoulder for the advance of medicine and for the inseparable progress of pharmacy.

MEDICAL NEWS.

A COMPLIMENTARY DINNER TO A CHIRURGEON.

DOCTOR H. O. WALKER, of Detroit, was tendered a complimentary dinner by professional colleagues on Wednesday evening, December 13, 1907. The event was conducted under the auspices of the Wayne County Medical Society, and dedicated in recognition of the standing and accomplishment attained by the guest of honor during a medical and surgical career extending over a period of forty years. About one hundred fifty professional friends participated in "the feast of reason and the flow of soul." After the multitude had been served, Doctor J. H. Carstens, toastmaster of the occasion, requested the reading of letters of regret from physicians near and far who could not be present, and in introducing Doctor Walker stated that the assembly was the largest for like purpose in the history of Detroit. The doctor spoke as follows:

When I first received information while at Columbus attending the meeting of the Mississippi Valley Medical Association, that a dinner was to be given me in honor of my having practiced medicine and surgery for forty years, the thought occurred—I wonder if the fellows of this society have had enough of me and this was a polite intimation that said, "Old fellow your time is up and you should be put away on the shelf." But afterwards I had another thought—which is strengthened by the presence of so many of you here tonight—that it was an expression of your good will toward me; that in the strife for success in our profession there is in us much of the milk of human kindness—still a goodfellowship that overbalances our ambition—and we occasionally take a day off, as Whittier says, "To make the world within our reach somewhat the better for our living and gladder for our human speech." This is, however (with apologies to Dooley), not a "retirement ratification." I wish to say at this time that I had never expected this, and I cannot express fully in words the gratification it affords me. It is a homecoming that can never be effaced from memory. Forty years is a long time to look forward to, yet it seems but yesterday since I received my diploma from old Bellevue on February 28, 1867. The teachers, distinguished as they were of that time, are all dead but one, and he is an old man, Austin Flint, Junior.

Memories of instances and events crowd so thick and fast that time will but allow for a passing notice of some. The war of the rebellion had but just closed when I entered upon my professional career, and the country had only entered the career of unsurpassed prosperity in every line of professionalism and commercialism. A medical education at that time only required two courses of less than six months each with only one compulsory laboratory course, that of anatomy, and but a limited amount of preparatory education. There was no control of the practice of medicine; in fact any one might assume the title of doctor. Today it is very much better, and we have a four years' course of nine months each, with laboratory instruction in every department. Most state boards of registration require, as an entrance to the study of medicine, a high school course, while many of them have and are fast approaching a literary degree of high standard. No longer does a degree from a medical college say that he who possesses it may practice medicine. This must be passed upon by a state board. While crudities still exist, advances are steadily increasing. In 1867 anesthetics were about the only thing that we had, except rapid operative technique with a better anatomical knowledge than we have now. We knew gross pathology, but had little knowledge of its microscopic appearances. Systematic and scientific antisepsis and asepsis did not commence until about ten years after this, with the development and better acquaintance of biology, comparative anatomy, physiologic chemistry, normal and pathologic histology, bacteriology, and the use of allied sciences with their new discoveries. Hospitals were few and far between.

I had the pleasure of being secretary of this society in 1869. The members at that time, as near as I can remember, were Doctors Zina Pitcher, a dignified practitioner of the old school and an ex-president of the American Medical Association; William Brodie, another ex-president of the American Medical Association, combative in nature, which was usually exercised in behalf of those oppressed, a man of goodly heart; E. W. Jenks, D. O. Farrand, George P. Andrews. S. P. Duffield and T. A. McGraw, who were the beginners in teaching advanced medicine and surgery, in establishing a preparatory school of medicine from which much has developed as to our standing and the making of this city a medical center. Three of these distinguished gentlemen have passed away. Two are still with us—Doctor Duffield, now reaping the earned laurels of retirement; Doctor McGraw, whose career is an open chapter, still actively engaged in the practice of his profession. Doctors Moses Gunn and Samuel G. Armour, who were also members and eminent teachers in the department of medicine and surgery, have long since passed away. Doctors Henry F. Lyster and H. E. Smith, who were then young men, and in whose offices most of our meetings were held at that time, are also numbered among the dead. There are some here who will remember Doctor Richard Inglis, a good man, who was beloved by every one who came in contact with him. He left an impress that did much towards advancement. Doctors Moses Gunn and Samuel G. Armour were members, and others whose names I do not recall. In looking about me I see those in the prime of life, old acquaintances and friends that I knew when they first commenced. I have always prized their acquaintanceship and association. There are many others whom I knew before, and at the time of the commencement of their medical career. I have watched with pleasure their work, and I have always felt that I could meet them as hale fellows well met. Others here are new-comers and have already shown that they are "lifters and not leaners."

The medical profession of Detroit stands prominently in the front rank. I feel that whatever success has come to me is largely due to you, and in closing I wish again to thank you for this expression of your regard for me.

The toasts of the occasion were: "Forty Years' Surgical Practice," T. A. McGraw; "Forty Years of Medicine in Detroit," J. Flintermann; "The University," V. C. Vaughan; "Detroit as a Medical Center," E. L. Shurly; "The Profession in Local History," Hal C. Wyman; "The Eye of the Surgeon," Eugene Smith; "H. O. Forty and Twenty Years Ago," Angus McLean; "The County Society," President A. N. Collins; "Walker and the Young Surgeon," C. M. Stafford.

The affair was a fitting mark for the fortieth milestone and will long be remembered with pleasure by everyone present.

FREDERICK THE GREAT AND THE DOCTORS.

MAMLOCK has recently published the correspondence of Frederick the Great (Enke, Stuttgart, 1907) showing the activity of the great king in medical and sanitary matters. The soundness of his views regarding the practice of medicine may be illustrated by the annotation he made in the claim of a Doctor von Brandenstaedt regarding an invention by which cannon could be transported by horses: "Denied; there is no lack of machines for destroying human life; as a physician it would be more becoming to use better the methods of preserving it." (F. Kayser, *Fortschritte der Medizin*, Number XXVIII, 1907.)

MINOR INTELLIGENCE.

LAVERAN, the pioneer researcher in malaria, has been awarded the Noble prize in Medicine for 1907.

THE Constitutional Convention now in session at Lansing, Michigan, has adopted a resolution prohibiting the sale and manufacture of cigarettes in Michigan.

DOCTOR SAMUEL GOLDBERG, a member of the staff of the North Texas Asylum for the Insane, died recently of injuries received in an encounter with an inmate.

STATISTICS disclose a scarcity of drug clerks, notwithstanding the decided increase in wages for that class of service. Undoubtedly the stringency is due to the recent elevation in requirements by state examining boards.

AN epidemic of diphtheria has developed at the Tewksbury (Massachusetts) almshouse, the cases being confined to the attendants and nurses. Report indicates that danger of spread of the disease to patients is not probable.

JAPAN is now one of the leading countries in the production of iodin, more than one-third of the world's output coming from Nippon shores. The Japanese export of this product for the past year amounted to over $500,000.

THE trustees of the Noble Fund have awarded the prize in physics for 1907 to Professor Albert A. Michealson, of the University of Chicago. This is the first time that the prize in physics has been awarded to an American scientist.

FIRE visited the New Jersey State Hospital for the Insane on the evening of November 27, completely destroying the building occupied by the nurses, three of whom were injured, though not fatally, by jumping from third story windows.

GERMAN authorities are working for the abolition of the cigar cutters common to modern tobacco shops. The allegation is made that smokers, after moistening the cigar with saliva, run it through the machine, thereby affording excellent opportunity for disease transmission.

THE German courts, after many years' litigation, have finally ruled that the American degree of Doctor of Dental Surgery may henceforth be used in Germany when issued by reputable colleges. The American degree has for many years been in bad repute in Germany.

DOCTOR EDMUND S. F. ARNOLD, for many years librarian of the New York State Medical Association Library, died on November 22, aged eighty-eight years. Doctor Arnold was an active worker in medical societies, and it was mainly through his effort that the library of the New York State Medical Association achieved its present proportions.

THE proprietors of the "Hermatological Institute," of New York City, an establishment for the regulation of facial defects, et cetera, were recently fined one hundred dollars each in the Court of Special Sessions, for practicing medicine without license.

MRS. HENRY PARSONS has been awarded a gold medal by the jury of awards of the Jamestown Exposition for her work in establishing the first childrens school farm in New York City. The farm is located in DeWitt Clinton Park, on the Hudson, and has proved of great benefit to the children.

THE Second International Congress on Sleeping Sickness will convene in London during February, 1908. Heretofore the meetings were held in November, but this year the delay is occasioned by the desire of the German government to present the findings of Koch's recent expedition to South Africa.

DOCTOR ISIDOR PIERCE OBERNDORFER, attending dermatologist to the German Dispensary, New York City, and a skin specialist of note, died in that metropolis of appendicitis on December 1. He was a graduate of the College of Physicians of New York City, 1874, and afterward pursued postgraduate study in Leipzig.

THE consolidation of the Louisville College of Medicine and the Hospital College of Medicine has been effected. Doctor Lewis S. McMurty is president of the new institution; Doctor Clint W. Kelly, dean of the faculty; and Doctor Walter F. Boggess, associate dean. Henceforth the school will be known as the Louisville and Hospital Medical College.

THE Cambridge School of Nursing, which was established in 1905, has been discontinued, owing to insufficient attendance. The course offered covered a period of four years, and the tuition was $150 for the first year and $75 for each of the succeeding years. The failure is perhaps evidence that at present nursing cannot be elevated to the plane of the learned professions.

REPORT has been received of the death of Doctor Albert Hoffa, the well-known orthopedic surgeon and professor in the University of Berlin. Doctor Hoffa was born in Richmond, Cape of Good Hope, in 1859, and received his medical degree at Marburg in 1883. In 1904, while on a visit to this country he received the honorary degree of Doctor of Medicine from Jefferson Medical College.

GRASMANN has been conducting bacteriologic experiments with a view to determining satisfactory disinfecting agents for use prior to surgical operations. He utilized successively the sublaminalcohol of Engle; the mixture of alcohol, ether, and one-half-per-cent nitric acid recommended by Schumberg; and the modified method of Fürbringer, but after employing iodobenzin in 0.1 per cent strength, concludes that this agent is superior in effect to the other three and recommends its employment.

THE Circuit Court in Chicago recently upheld the validity of the vaccination law in a suit brought by a citizen to compel the Board of Education to admit his seven-year-old daughter to one of the public schools of the city, without being vaccinated.

THE death of Doctor George F. Shrady, founder in 1866, and editor until 1904, of *The Medical Record,* occurred on November 30, after an acute illness of two weeks. Doctor Shrady was born in New York City on January 14, 1837, and received his medical training at the College of Physicians and Surgeons, from which he took his degree in 1858. He was eminent as a surgeon and medical writer. He is survived by a wife and several children, together with a brother, Doctor John Shrady, who will be remembered as a former president of the New York County Medical Society.

THE promising career of Mr. A. Mactier Pirrie has been terminated by his zeal in the interest of science. Receiving his medical degree from Edinburgh in 1906 he became interested in the study of tropical diseases, and in the year of his graduation made his first expedition up the Nile to the Sudan and remote parts of Bahr-el-Ghazal, under the direction of Doctor Andrew Balfour. The unfortunate contraction of tropical fever necessitated his return to England and terminated in his death on November 12. A report of his investigations was presented at the last meeting of the British Medical Association, and many specimens in his scientific collection were demonstrated.

RECENT LITERATURE.

REVIEWS.

THORNTON'S POCKET MEDICAL FORMULARY.*

This is a convenient book of reference. In these days, when a general effort is being made to make as far as possible the prescribing and compounding of drugs a matter that concerns the physician and the druggist alone, the demand for this kind of a book is certainly greater than it has ever been before. Physicians that are attempting to improve the art and science of prescribing drugs will receive nothing but aid if they will make use of the information contained in this work.

D. L. P.

*Containing about two thousand prescriptions with indications for their use. New (eighth) edition, revised to accord with the new United States Pharmacopeia. In one leather bound volume. Price, $1.50 net. Lea Brothers & Company, Publishers, Philadelphia and New York, 1907.

SAUNDERS' POCKET MEDICAL FORMULARY.*

WILLIAM M. POWELL, M. D., has compiled a valuable and convenient office desk book. It contains much information on various subjects, such as dosage, poisons, resuscitation, incompatibles, et cetera. Its greatest value, however, comes from the prescriptions and formulæ it contains. These are associated with the disease or condition in which they are indicated, the diseases and conditions themselves being arranged alphabetically. There is a growing demand for works of this kind and Saunders' book can be recommended as one of the leaders of its class. D. L. P.

*By William M. Powell, M. D., author of "Essentials of Diseases of Children;" member of Philadelphia Pathologic Society. Eighth edition, adapted to the new (1905) Pharmacopeia. Philadelphia and London: W. B. Saunders Company, 1906. In flexible morocco, with side index, wallet and flap. $1.75 net.

THE TECHNIC OF OPERATIONS UPON THE INTESTINES AND STOMACH.*

THE writer of this book has taken great pains to use only the best of everything to be presented. It represents a great amount of well-conducted experimental work, and a careful preparation and selection of illustrations. Every step of the operations is so clearly marked out and the text so concisely written that it must be of great service to all who desire an accurate knowledge of this branch of surgery. He acknowledges the generous help of good friends, not a few of them shining lights in surgery. It is a pleasure to possess the book: a valuable acquisition to know all that it contains. C. G. D.

*The Technic of Operations Upon the Intestines and Stomach. By Alfred H. Gould, M. D., of Boston, Massachusetts. Octavo volume, containing 190 beautiful original illustrations, some of them in colors. Cloth, $5.00 net; half morocco, $6.00 net. Philadelphia and London: W. B. Saunders Company.

FOLIA THERAPEUTICA.*

THE first volume of this journal has just been completed. It is handsomely printed, contains a well-selected series of original articles and abstracts and a Current Literature Department on therapeutics. Though not as exhaustive as some special journals on therapeutics, it probably is for that very reason better adapted to the needs of the general practitioner. Appearing quarterly for the moderate sum of $1.00 a year (four shillings), it also does not demand either very much time or very much money. Among the articles in the volume just completed may be mentioned a few to indicate the scope. The well known therapeutic writer, F. Penzoldt, writes on "Drug Treatment." G. S. Haines has a good practical article on the "Cardiac Tonics," in which the newer preparations are critically considered. Kuhn writes on the "Treatment of Pulmonary Tuberculosis by Hyperemia and Acceleration of the Lymph Stream induced by the Pulmonary Suction Mask." Finzi writes on "*X*-ray Therapeutics"; H. Strauss on "Chloride Deprivation in Bright's Disease." The abstracts cover a wide range. Reviews of works on therapeutics are numerous. The new journal has a definite field and covers it in such a way as to deserve support. G. D.

*Edited by A. Baginsky and J. Snowman. London, John Bale, Sons & Danielsson.

ABDOMINAL HERNIA.*

It is so often the case nowadays that new books, even treatises, come to us from the hands of those whose judgment has not been matured by long experience, that we are already prejudiced in favor of this work. In the course of a careful perusal of its several chapters we note frequently the safe and conservative views of the author. We might wish almost he were even more radical in showing less regard for the mechanical treatment of hernia. He has taken a perfectly sane view of the matter, however, and given us a most comprehensive and practical statement of that subject. His work is individual, and while it excludes the views of some whom we expected to find quoted, we are willing to accept his statement as unprejudiced that they have not shown the merit of those expressed.

The author has addressed this book to the physician. The latter will surely find proper guidance. More pretentious treatises have been published but none more to the point with a proper regard for all sides of the question, and attractive to the surgeon as well as to the physician. F. B. W.

*By W. B. De Garmo, M. D., Professor Special Surgery, New York Post-Graduate Medical School and Hospital. J. B. Lippincott Company, Philadelphia, 1907. Price $5.00 net.

SYLLABUS OF LECTURES ON HUMAN EMBRYOLOGY.*

This little book fulfills, very well, its announced mission. It is of considerable value in connection with the large text-book in the study of embryology. The drawings are simple and easily understood. The appendix on practical laboratory work is quite commendable. The manual serves the practitioner admirably in "brushing up" on embryological science. C. G. P.

*An Introduction to the Study of Obstetrics and Gynecology. For Medical Students and Practitioners. By Walter P. Manton, M. D., Professor of Clinical Gynecology and Professor Adjunct of Obstetrics in the Detroit College of Medicine; Fellow of the Zoölogical Society of London, of the Michigan Academy of Science, et cetera. Third edition. Illustrated. F. A. Davis & Company, Philadelphia, 1906.

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